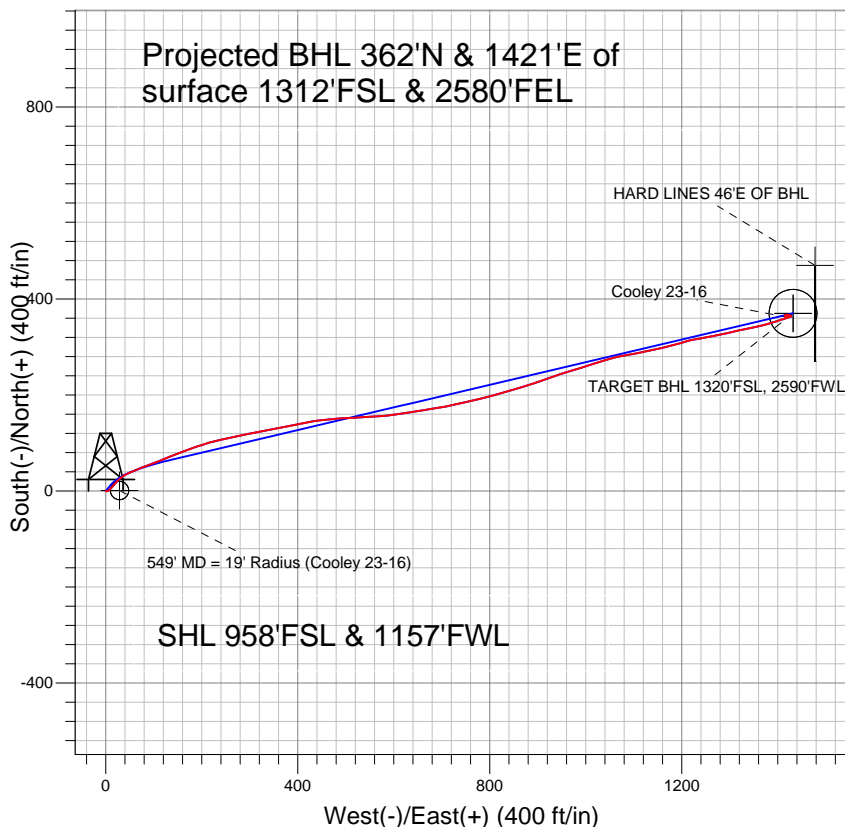


Anadarko, Weld County CO

Projected BHL 362'N & 1421'E of
surface 1312'FSL & 2580'FEL



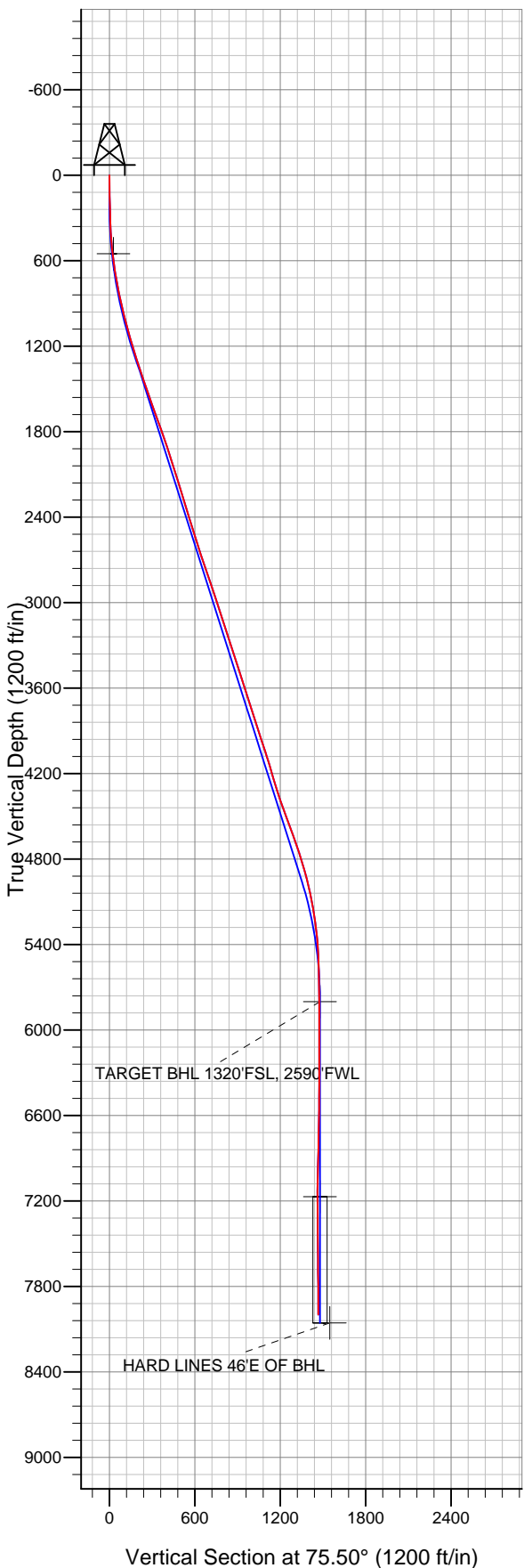
LEGEND

- ◆ Cooley 23-16, Wellbore #1, Plan #1 (7-26-11) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
8220'MD & 7998'TVD @ 1467'VS
0.2 deg Inc 106.0 deg AZ

Project: SEC.16-T2N-R68W
Site: Cooley 19-16 Pad Sec.16-T2N-R68W
Well: Cooley 23-16
Plan: Wellbore #1





Directional

Anadarko, Weld County CO

SEC.16-T2N-R68W

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

Cooley 23-16

Wellbore #1

Survey: Survey #1

Standard Survey Report

29 August, 2011

Company:	Anadarko, Weld County CO	Local Co-ordinate Reference:	Well Cooley 23-16
Project:	SEC.16-T2N-R68W	TVD Reference:	WELL @ 4900.0ft (Original Well Elev)
Site:	Cooley 19-16 Pad Sec.16-T2N-R68W	MD Reference:	WELL @ 4900.0ft (Original Well Elev)
Well:	Cooley 23-16	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

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

Well	Cooley 23-16		
Well Position	+N/-S	0.0 ft	Northing: 1,292,075.62 ft
	+E/-W	0.0 ft	Easting: 3,136,022.65 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	40.134117
		Longitude:	-105.013512
		Ground Level:	4,885.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/2/2011	8.96	66.79	52,950

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	75.50	

Survey Program	Date	8/29/2011			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
144.0	8,220.0	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	
144.0	1.00	103.20	144.0	-0.3	1.2	1.1	0.69	0.69	0.00	
233.0	1.50	82.40	233.0	-0.3	3.1	3.0	0.75	0.56	-23.37	
325.0	2.60	52.70	324.9	1.1	6.0	6.1	1.62	1.20	-32.28	
417.0	4.00	41.80	416.8	4.8	9.8	10.7	1.66	1.52	-11.85	
509.0	6.30	38.30	508.4	11.1	15.1	17.4	2.52	2.50	-3.80	
551.5	7.21	42.49	550.6	14.9	18.3	21.5	2.43	2.13	9.86	
549' MD = 19' Radius (Cooley 23-16)										
601.0	8.30	46.20	599.6	19.7	23.0	27.2	2.43	2.21	7.49	
693.0	10.00	49.20	690.5	29.5	33.8	40.1	1.92	1.85	3.26	
785.0	11.40	68.40	780.9	38.1	48.3	56.3	4.14	1.52	20.87	
876.0	13.30	69.10	869.8	45.1	66.5	75.6	2.09	2.09	0.77	
902.0	13.70	68.40	895.1	47.3	72.1	81.7	1.66	1.54	-2.69	

Company:	Anadarko, Weld County CO	Local Co-ordinate Reference:	Well Cooley 23-16
Project:	SEC.16-T2N-R68W	TVD Reference:	WELL @ 4900.0ft (Original Well Elev)
Site:	Cooley 19-16 Pad Sec.16-T2N-R68W	MD Reference:	WELL @ 4900.0ft (Original Well Elev)
Well:	Cooley 23-16	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)
980.0	14.00	67.80	970.8	54.3	89.4	100.2	0.43	0.38	-0.77
1,075.0	14.70	69.10	1,062.8	62.9	111.3	123.6	0.81	0.74	1.37
1,170.0	15.90	68.00	1,154.5	72.1	134.7	148.4	1.30	1.26	-1.16
1,266.0	17.80	68.90	1,246.3	82.3	160.6	176.0	2.00	1.98	0.94
1,361.0	17.90	71.40	1,336.8	92.2	187.9	205.0	0.81	0.11	2.63
1,456.0	18.60	74.40	1,427.0	100.9	216.4	234.7	1.23	0.74	3.16
1,551.0	19.40	77.30	1,516.8	108.5	246.4	265.7	1.30	0.84	3.05
1,646.0	20.00	78.70	1,606.2	115.1	277.7	297.7	0.80	0.63	1.47
1,741.0	20.00	79.30	1,695.5	121.3	309.6	330.1	0.22	0.00	0.63
1,836.0	19.70	78.70	1,784.9	127.5	341.2	362.3	0.38	-0.32	-0.63
1,932.0	19.00	78.60	1,875.5	133.7	372.4	394.0	0.73	-0.73	-0.10
2,027.0	18.40	78.90	1,965.4	139.7	402.3	424.5	0.64	-0.63	0.32
2,122.0	17.10	80.50	2,055.9	144.9	430.8	453.3	1.46	-1.37	1.68
2,217.0	16.40	84.20	2,146.9	148.5	457.9	480.5	1.34	-0.74	3.89
2,313.0	17.10	86.50	2,238.8	150.8	485.5	507.8	1.00	0.73	2.40
2,410.0	17.50	86.50	2,331.4	152.5	514.3	536.1	0.41	0.41	0.00
2,505.0	18.30	86.30	2,421.8	154.4	543.4	564.7	0.84	0.84	-0.21
2,600.0	18.60	86.70	2,511.9	156.2	573.4	594.3	0.34	0.32	0.42
2,695.0	18.00	81.00	2,602.1	159.4	603.0	623.7	1.99	-0.63	-6.00
2,791.0	18.00	81.20	2,693.4	163.9	632.4	653.3	0.06	0.00	0.21
2,886.0	18.60	81.20	2,783.6	168.5	661.8	682.9	0.63	0.63	0.00
2,981.0	18.90	80.90	2,873.6	173.3	692.0	713.3	0.33	0.32	-0.32
3,076.0	18.10	78.00	2,963.7	178.8	721.6	743.4	1.28	-0.84	-3.05
3,171.0	18.40	76.50	3,053.9	185.3	750.6	773.1	0.59	0.32	-1.58
3,266.0	17.90	76.60	3,144.2	192.2	779.4	802.7	0.53	-0.53	0.11
3,362.0	17.50	74.70	3,235.6	199.4	807.7	831.9	0.73	-0.42	-1.98
3,457.0	18.40	74.40	3,326.0	207.2	835.9	861.2	0.95	0.95	-0.32
3,552.0	18.10	73.10	3,416.2	215.6	864.5	890.9	0.53	-0.32	-1.37
3,647.0	17.80	71.40	3,506.6	224.5	892.4	920.1	0.64	-0.32	-1.79
3,742.0	17.90	70.10	3,597.0	234.1	919.8	949.2	0.43	0.11	-1.37
3,837.0	17.80	71.50	3,687.5	243.7	947.3	978.2	0.46	-0.11	1.47
3,932.0	18.20	73.80	3,777.8	252.4	975.4	1,007.5	0.86	0.42	2.42
4,028.0	17.30	72.20	3,869.3	261.0	1,003.4	1,036.7	1.07	-0.94	-1.67
4,123.0	18.40	72.40	3,959.7	269.8	1,031.1	1,065.8	1.16	1.16	0.21
4,218.0	18.30	75.60	4,049.8	278.1	1,059.8	1,095.7	1.07	-0.11	3.37
4,313.0	16.50	80.30	4,140.5	284.0	1,087.6	1,124.1	2.40	-1.89	4.95
4,408.0	16.70	80.20	4,231.5	288.6	1,114.3	1,151.1	0.21	0.21	-0.11
4,503.0	17.10	77.50	4,322.4	294.0	1,141.4	1,178.7	0.93	0.42	-2.84
4,599.0	19.60	74.20	4,413.6	301.4	1,170.7	1,208.9	2.82	2.60	-3.44
4,694.0	20.90	75.10	4,502.7	310.1	1,202.4	1,241.7	1.41	1.37	0.95
4,789.0	19.70	80.50	4,591.8	317.1	1,234.6	1,274.6	2.34	-1.26	5.68
4,884.0	19.30	78.60	4,681.3	322.9	1,265.8	1,306.3	0.79	-0.42	-2.00
4,979.0	17.90	77.70	4,771.4	329.1	1,295.4	1,336.5	1.50	-1.47	-0.95
5,074.0	16.40	77.00	4,862.1	335.2	1,322.7	1,364.5	1.59	-1.58	-0.74
5,170.0	14.20	79.10	4,954.7	340.5	1,347.5	1,389.8	2.36	-2.29	2.19
5,264.0	12.00	75.10	5,046.3	345.2	1,368.3	1,411.1	2.53	-2.34	-4.26
5,359.0	9.80	72.40	5,139.6	350.2	1,385.5	1,429.1	2.38	-2.32	-2.84
5,454.0	8.10	74.20	5,233.4	354.4	1,399.7	1,443.8	1.81	-1.79	1.89
5,549.0	5.90	70.00	5,327.7	357.9	1,410.7	1,455.4	2.38	-2.32	-4.42
5,645.0	4.00	71.40	5,423.3	360.7	1,418.5	1,463.6	1.98	-1.98	1.46
5,740.0	2.50	61.20	5,518.2	362.7	1,423.5	1,469.0	1.69	-1.58	-10.74
5,835.0	0.80	108.50	5,613.1	363.5	1,425.9	1,471.5	2.15	-1.79	49.79
5,930.0	0.40	119.90	5,708.1	363.1	1,426.8	1,472.3	0.44	-0.42	12.00
6,021.9	0.30	115.31	5,800.0	362.9	1,427.3	1,472.7	0.11	-0.11	-5.00

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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)
TARGET BHL 1320'FSL, 2590'FWL									
6,025.0	0.30	115.10	5,803.1	362.9	1,427.4	1,472.7	0.11	-0.10	-6.66
6,120.0	0.20	84.40	5,898.1	362.8	1,427.7	1,473.1	0.17	-0.11	-32.32
6,215.0	0.10	15.30	5,993.1	362.9	1,427.9	1,473.3	0.20	-0.11	-72.74
6,311.0	0.40	352.50	6,089.1	363.3	1,427.9	1,473.4	0.32	0.31	-23.75
6,406.0	0.30	343.30	6,184.1	363.9	1,427.8	1,473.4	0.12	-0.11	-9.68
6,501.0	0.30	328.50	6,279.1	364.3	1,427.6	1,473.3	0.08	0.00	-15.58
6,596.0	0.60	317.30	6,374.1	364.9	1,427.1	1,473.0	0.33	0.32	-11.79
6,687.0	0.60	310.80	6,465.1	365.5	1,426.4	1,472.5	0.07	0.00	-7.14
6,782.0	0.80	298.80	6,560.1	366.2	1,425.5	1,471.8	0.26	0.21	-12.63
6,877.0	0.90	286.20	6,655.1	366.7	1,424.2	1,470.6	0.22	0.11	-13.26
6,972.0	1.10	274.00	6,750.1	367.0	1,422.6	1,469.1	0.31	0.21	-12.84
7,067.0	1.30	268.60	6,845.1	367.0	1,420.6	1,467.2	0.24	0.21	-5.68
7,162.0	1.60	264.20	6,940.0	366.9	1,418.2	1,464.9	0.34	0.32	-4.63
7,258.0	1.80	254.80	7,036.0	366.3	1,415.4	1,462.0	0.36	0.21	-9.79
7,353.0	1.20	154.30	7,131.0	365.0	1,414.4	1,460.7	2.46	-0.63	-105.79
7,392.1	1.11	148.24	7,170.1	364.4	1,414.8	1,460.9	0.39	-0.24	-15.50
TARGET CIRCLE 1320'FSL, 2590'FWL									
7,448.0	1.00	137.80	7,226.0	363.5	1,415.4	1,461.3	0.39	-0.19	-18.67
7,543.0	0.60	124.80	7,320.9	362.6	1,416.3	1,462.0	0.46	-0.42	-13.68
7,638.0	0.60	116.40	7,415.9	362.1	1,417.2	1,462.7	0.09	0.00	-8.84
7,733.0	0.60	99.00	7,510.9	361.8	1,418.1	1,463.5	0.19	0.00	-18.32
7,829.0	0.50	94.60	7,606.9	361.7	1,419.0	1,464.4	0.11	-0.10	-4.58
7,924.0	0.40	77.20	7,701.9	361.8	1,419.8	1,465.1	0.18	-0.11	-18.32
8,019.0	0.40	78.70	7,796.9	361.9	1,420.4	1,465.8	0.01	0.00	1.58
8,114.0	0.30	84.40	7,891.9	362.0	1,421.0	1,466.4	0.11	-0.11	6.00
8,170.0	0.20	106.00	7,947.9	362.0	1,421.2	1,466.6	0.24	-0.18	38.57
8,220.0	0.20	106.00	7,997.9	361.9	1,421.4	1,466.7	0.00	0.00	0.00
HARD LINES 46'E OF BHL									

Checked By: _____	Approved By: _____	Date: _____
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