

Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: **Thistle Down PC F36-65HN**

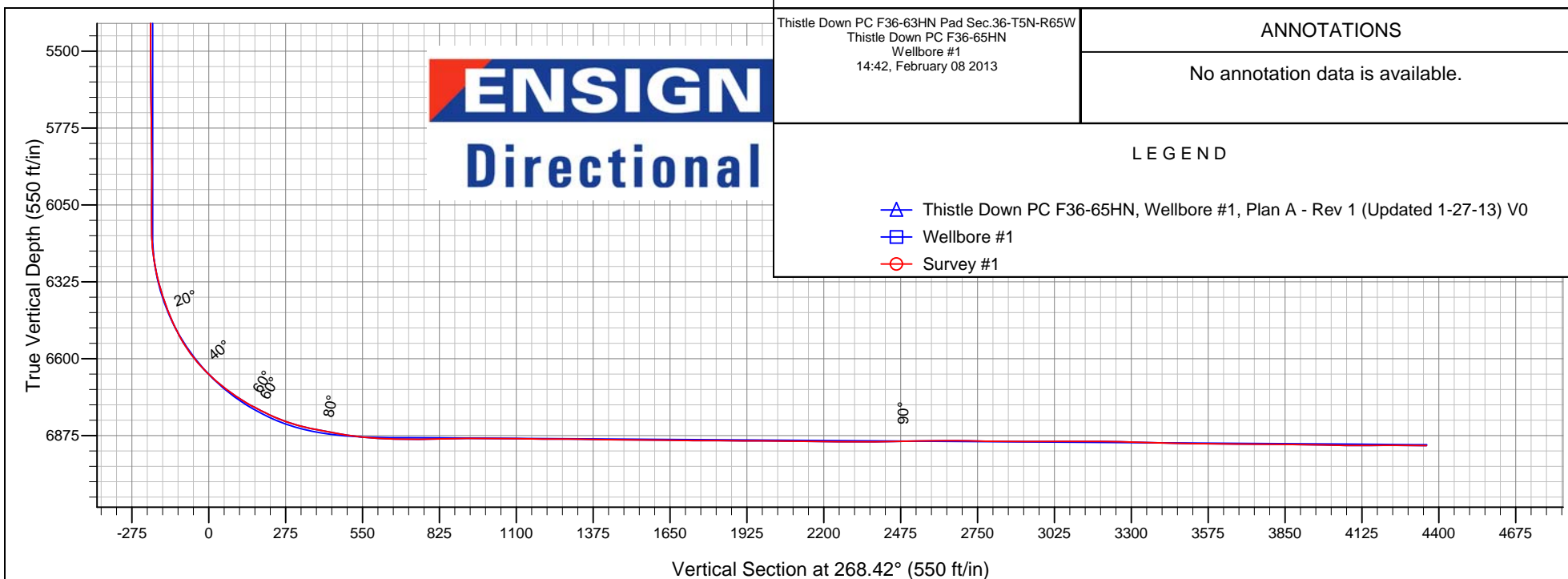
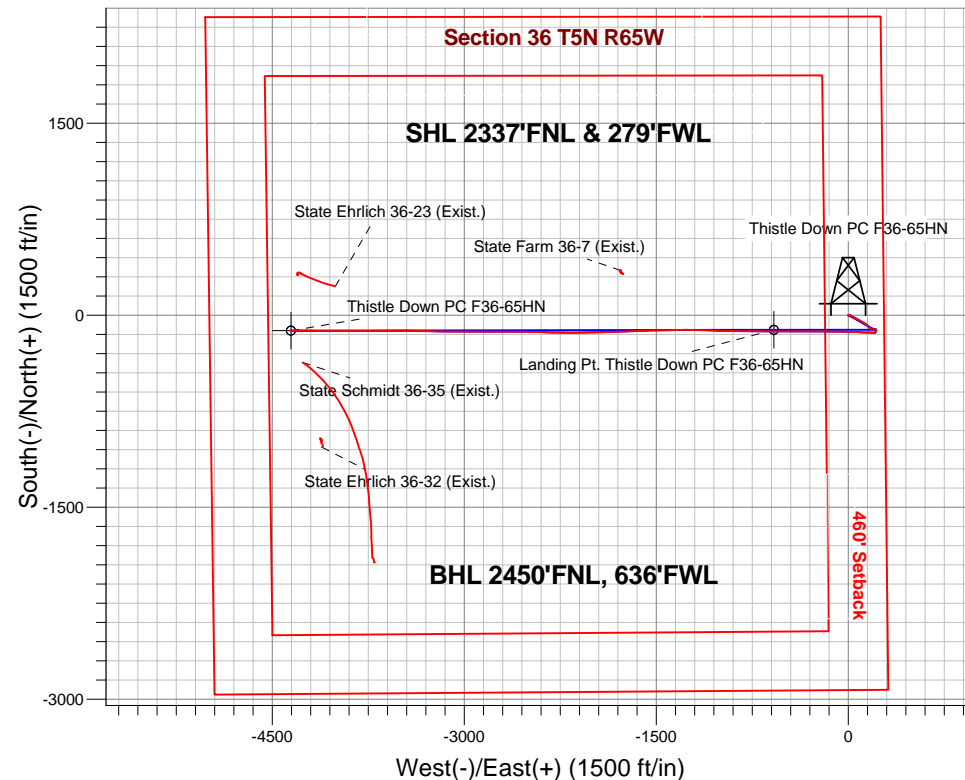
Surface Location: Thistle Down PC F36-63HN Pad Sec.36-T5N-R65W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
Ground Elevation: 4770.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1373959.58	3249968.86	40.356450	-104.603040	

Precision #828 KB - 16' WELL @ 4786.0ft (Precision #828 KB - 16')

FINAL SURVEY

Projected Bottom Hole Location
11142' MD 6911' TVD 121' S & 4354' W of SHL
89.4 degree Incl @ 270.4 degree AZM





Noble Energy Inc.- Weld County, CO (Grid North)

Sec.36-T5N-R65W

Thistle Down PC F36-63HN Pad Sec.36-T5N-R65W

Thistle Down PC F36-65HN

Wellbore #1

Survey: Survey #1

Standard Survey Report

08 February, 2013

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
634.0	0.00	0.00	634.0	0.0	0.0	0.0	0.00	0.00	0.00
661.0	0.70	165.70	661.0	-0.2	0.0	0.0	2.59	2.59	0.00
751.0	0.70	177.40	751.0	-1.2	0.2	-0.2	0.16	0.00	13.00
841.0	0.90	141.20	841.0	-2.3	0.7	-0.6	0.59	0.22	-40.22
930.0	0.70	125.90	930.0	-3.2	1.5	-1.5	0.33	-0.22	-17.19
1,020.0	0.60	88.70	1,020.0	-3.5	2.5	-2.4	0.47	-0.11	-41.33
1,128.0	0.50	49.60	1,128.0	-3.2	3.4	-3.3	0.35	-0.09	-36.20
1,223.0	0.20	8.20	1,223.0	-2.8	3.7	-3.6	0.39	-0.32	-43.58
1,318.0	1.10	346.50	1,318.0	-1.7	3.5	-3.5	0.97	0.95	-22.84
1,413.0	0.10	298.70	1,413.0	-0.8	3.3	-3.2	1.09	-1.05	-50.32

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Thistle Down PC F36-65HN
Project:	Sec.36-T5N-R65W	TVD Reference:	WELL @ 4786.0ft (Precision #828 KB - 16')
Site:	Thistle Down PC F36-63HN Pad	MD Reference:	WELL @ 4786.0ft (Precision #828 KB - 16')
Well:	Thistle Down PC F36-65HN	North Reference:	Grid
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)
1,508.0	0.50	12.00	1,507.9	-0.3	3.3	-3.3	0.51	0.42	77.16
1,603.0	0.80	15.40	1,602.9	0.7	3.5	-3.5	0.32	0.32	3.58
1,698.0	0.50	79.90	1,697.9	1.4	4.1	-4.2	0.78	-0.32	67.89
1,793.0	0.30	114.20	1,792.9	1.4	4.7	-4.8	0.32	-0.21	36.11
1,888.0	0.50	175.50	1,887.9	0.9	5.0	-5.0	0.47	0.21	64.53
1,999.0	1.60	71.60	1,998.9	0.9	6.5	-6.5	1.61	0.99	-93.60
2,089.0	3.50	106.10	2,088.8	0.5	10.3	-10.4	2.62	2.11	38.33
2,179.0	5.10	110.10	2,178.6	-1.6	16.7	-16.7	1.81	1.78	4.44
2,268.0	6.20	124.90	2,267.1	-5.7	24.4	-24.2	2.04	1.24	16.63
2,358.0	5.90	119.10	2,356.6	-10.8	32.4	-32.1	0.76	-0.33	-6.44
2,448.0	6.30	122.40	2,446.1	-15.7	40.6	-40.2	0.59	0.44	3.67
2,538.0	7.50	118.40	2,535.5	-21.1	50.0	-49.4	1.44	1.33	-4.44
2,628.0	8.50	114.30	2,624.6	-26.6	61.2	-60.4	1.28	1.11	-4.56
2,718.0	9.80	120.70	2,713.5	-33.3	73.9	-72.9	1.83	1.44	7.11
2,808.0	11.60	117.70	2,801.9	-41.4	88.5	-87.3	2.09	2.00	-3.33
2,898.0	12.50	121.70	2,889.9	-50.7	104.8	-103.3	1.36	1.00	4.44
2,988.0	12.00	118.50	2,977.9	-60.3	121.3	-119.6	0.94	-0.56	-3.56
3,077.0	11.30	121.90	3,065.0	-69.3	136.8	-134.8	1.10	-0.79	3.82
3,167.0	9.90	139.80	3,153.5	-79.9	149.3	-147.0	3.96	-1.56	19.89
3,257.0	8.50	138.40	3,242.4	-90.8	158.7	-156.1	1.58	-1.56	-1.56
3,347.0	6.90	138.10	3,331.5	-99.8	166.7	-163.9	1.78	-1.78	-0.33
3,437.0	8.40	120.70	3,420.7	-107.2	176.0	-173.0	3.05	1.67	-19.33
3,527.0	5.60	97.30	3,510.1	-111.1	186.0	-182.9	4.38	-3.11	-26.00
3,617.0	4.30	86.60	3,599.8	-111.4	193.7	-190.6	1.77	-1.44	-11.89
3,707.0	3.90	73.20	3,689.5	-110.4	200.0	-196.9	1.15	-0.44	-14.89
3,796.0	3.30	76.00	3,778.3	-108.9	205.4	-202.3	0.70	-0.67	3.15
3,886.0	2.60	101.00	3,868.2	-108.6	209.9	-206.8	1.61	-0.78	27.78
3,976.0	1.10	119.40	3,958.2	-109.4	212.7	-209.6	1.77	-1.67	20.44
4,066.0	0.90	134.90	4,048.2	-110.4	213.9	-210.8	0.37	-0.22	17.22
4,156.0	0.70	138.40	4,138.2	-111.3	214.8	-211.6	0.23	-0.22	3.89
4,246.0	0.80	138.10	4,228.2	-112.1	215.6	-212.4	0.11	0.11	-0.33
4,336.0	0.80	122.20	4,318.1	-112.9	216.5	-213.3	0.25	0.00	-17.67
4,426.0	0.60	108.00	4,408.1	-113.4	217.5	-214.3	0.29	-0.22	-15.78
4,516.0	1.20	122.60	4,498.1	-114.1	218.8	-215.5	0.71	0.67	16.22
4,605.0	1.70	220.90	4,587.1	-115.6	218.7	-215.4	2.49	0.56	110.45
4,695.0	1.40	226.80	4,677.1	-117.3	217.0	-213.7	0.38	-0.33	6.56
4,785.0	0.60	172.50	4,767.1	-118.6	216.3	-212.9	1.29	-0.89	-60.33
4,875.0	1.10	225.60	4,857.1	-119.6	215.7	-212.3	0.98	0.56	59.00
4,964.0	1.50	228.20	4,946.0	-121.0	214.2	-210.8	0.45	0.45	2.92
5,054.0	1.10	202.40	5,036.0	-122.6	213.0	-209.6	0.78	-0.44	-28.67
5,144.0	1.50	218.60	5,126.0	-124.3	211.9	-208.4	0.60	0.44	18.00
5,234.0	1.50	183.80	5,216.0	-126.4	211.1	-207.6	1.00	0.00	-38.67
5,324.0	1.10	164.10	5,305.9	-128.4	211.3	-207.7	0.66	-0.44	-21.89
5,414.0	1.10	151.90	5,395.9	-130.0	211.9	-208.3	0.26	0.00	-13.56
5,504.0	1.10	209.10	5,485.9	-131.5	211.9	-208.2	1.17	0.00	63.56
5,594.0	1.10	188.90	5,575.9	-133.1	211.4	-207.6	0.43	0.00	-22.44
5,684.0	0.90	234.20	5,665.9	-134.4	210.7	-206.9	0.88	-0.22	50.33
5,773.0	1.00	286.10	5,754.9	-134.6	209.4	-205.6	0.94	0.11	58.31
5,863.0	0.50	287.10	5,844.9	-134.3	208.2	-204.4	0.56	-0.56	1.11
5,953.0	0.60	199.80	5,934.9	-134.6	207.7	-203.9	0.85	0.11	-97.00
6,043.0	0.70	172.90	6,024.8	-135.6	207.6	-203.8	0.35	0.11	-29.89
6,133.0	1.10	131.20	6,114.8	-136.7	208.3	-204.5	0.82	0.44	-46.33
6,178.0	2.10	266.00	6,159.8	-137.0	207.8	-204.0	6.62	2.22	299.56

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6,223.0	5.30	270.60	6,204.7	-137.1	204.9	-201.1	7.14	7.11	10.22
6,267.0	9.10	274.50	6,248.4	-136.8	199.4	-195.6	8.70	8.64	8.86
6,312.0	12.00	274.50	6,292.6	-136.1	191.2	-187.4	6.44	6.44	0.00
6,357.0	15.10	271.70	6,336.3	-135.6	180.7	-176.9	7.04	6.89	-6.22
6,402.0	18.60	269.50	6,379.4	-135.5	167.6	-163.8	7.90	7.78	-4.89
6,447.0	20.70	270.40	6,421.8	-135.5	152.5	-148.7	4.71	4.67	2.00
6,492.0	23.90	273.40	6,463.4	-134.9	135.4	-131.7	7.55	7.11	6.67
6,537.0	27.30	273.40	6,504.0	-133.7	116.0	-112.3	7.56	7.56	0.00
6,582.0	31.00	272.90	6,543.3	-132.5	94.2	-90.5	8.24	8.22	-1.11
6,627.0	36.10	272.50	6,580.8	-131.4	69.3	-65.7	11.34	11.33	-0.89
6,672.0	41.20	271.80	6,615.9	-130.3	41.2	-37.6	11.37	11.33	-1.56
6,717.0	45.50	270.10	6,648.6	-129.8	10.4	-6.8	9.90	9.56	-3.78
6,762.0	48.50	270.40	6,679.3	-129.7	-22.5	26.1	6.68	6.67	0.67
6,807.0	52.40	270.90	6,708.0	-129.3	-57.2	60.8	8.71	8.67	1.11
6,851.0	56.40	271.50	6,733.6	-128.5	-93.0	96.5	9.16	9.09	1.36
6,896.0	59.60	272.00	6,757.4	-127.4	-131.1	134.6	7.17	7.11	1.11
6,941.0	62.90	271.50	6,779.1	-126.2	-170.6	174.0	7.40	7.33	-1.11
6,986.0	64.80	270.60	6,798.9	-125.4	-210.9	214.3	4.59	4.22	-2.00
7,031.0	68.10	269.90	6,816.9	-125.3	-252.2	255.5	7.47	7.33	-1.56
7,076.0	72.30	270.20	6,832.1	-125.2	-294.5	297.9	9.35	9.33	0.67
7,121.0	76.60	270.10	6,844.2	-125.1	-337.9	341.2	9.56	9.56	-0.22
7,166.0	79.40	269.50	6,853.5	-125.3	-381.9	385.2	6.36	6.22	-1.33
7,220.0	79.70	269.40	6,863.3	-125.8	-435.0	438.3	0.58	0.56	-0.19
7,302.0	82.50	270.10	6,876.0	-126.1	-516.0	519.3	3.52	3.41	0.85
7,347.0	84.40	270.20	6,881.1	-126.0	-560.7	563.9	4.23	4.22	0.22
7,368.2	85.15	270.29	6,883.1	-125.9	-581.8	585.0	3.58	3.56	0.44
Landing Pt. Thistle Down PC F36-65HN									
7,392.0	86.00	270.40	6,884.9	-125.8	-605.5	608.8	3.58	3.56	0.44
7,437.0	88.10	270.40	6,887.2	-125.4	-650.5	653.7	4.67	4.67	0.00
7,527.0	91.00	271.30	6,887.9	-124.1	-740.4	743.6	3.37	3.22	1.00
7,617.0	91.50	269.50	6,886.0	-123.5	-830.4	833.5	2.08	0.56	-2.00
7,707.0	89.80	270.90	6,884.9	-123.2	-920.4	923.4	2.45	-1.89	1.56
7,797.0	89.80	272.40	6,885.3	-120.6	-1,010.4	1,013.3	1.67	0.00	1.67
7,887.0	89.20	271.30	6,886.0	-117.7	-1,100.3	1,103.1	1.39	-0.67	-1.22
7,977.0	90.00	271.10	6,886.7	-115.8	-1,190.3	1,193.0	0.92	0.89	-0.22
8,066.0	89.60	269.90	6,887.0	-115.0	-1,279.3	1,282.0	1.42	-0.45	-1.35
8,157.0	88.50	269.70	6,888.5	-115.3	-1,370.3	1,372.9	1.23	-1.21	-0.22
8,246.0	90.00	268.80	6,889.6	-116.5	-1,459.2	1,461.9	1.97	1.69	-1.01
8,336.0	89.30	268.10	6,890.2	-118.9	-1,549.2	1,551.9	1.10	-0.78	-0.78
8,426.0	89.30	268.10	6,891.3	-121.9	-1,639.1	1,641.9	0.00	0.00	0.00
8,516.0	89.50	267.40	6,892.2	-125.4	-1,729.1	1,731.9	0.81	0.22	-0.78
8,606.0	90.00	266.90	6,892.6	-129.9	-1,819.0	1,821.9	0.79	0.56	-0.56
8,696.0	89.10	269.20	6,893.3	-133.0	-1,908.9	1,911.8	2.74	-1.00	2.56
8,786.0	89.80	268.80	6,894.2	-134.6	-1,998.9	2,001.8	0.90	0.78	-0.44
8,875.0	89.40	270.60	6,894.8	-135.0	-2,087.9	2,090.8	2.07	-0.45	2.02
8,965.0	89.50	269.90	6,895.7	-134.6	-2,177.9	2,180.8	0.79	0.11	-0.78
9,055.0	89.20	270.90	6,896.7	-134.0	-2,267.9	2,270.7	1.16	-0.33	1.11
9,146.0	90.40	270.40	6,897.0	-133.0	-2,358.8	2,361.6	1.43	1.32	-0.55
9,235.0	91.30	271.80	6,895.7	-131.3	-2,447.8	2,450.5	1.87	1.01	1.57
9,325.0	91.10	270.90	6,893.8	-129.1	-2,537.8	2,540.4	1.02	-0.22	-1.00
9,415.0	90.30	270.20	6,892.7	-128.3	-2,627.8	2,630.3	1.18	-0.89	-0.78
9,504.0	88.70	270.20	6,893.5	-128.0	-2,716.8	2,719.3	1.80	-1.80	0.00

