

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

Well Name: **Heartland State G36-75-1HN**

Surface Location: Heartland State G36-75-1HN Pad Sec.25-T4N-R65W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

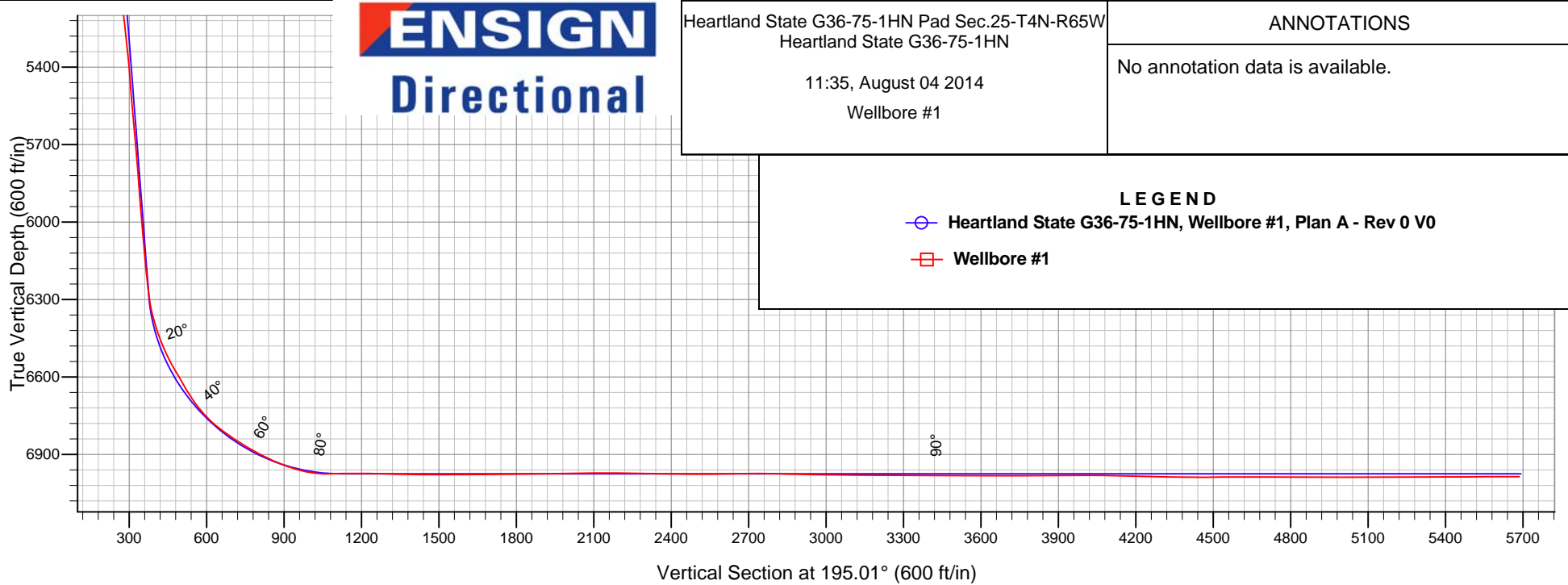
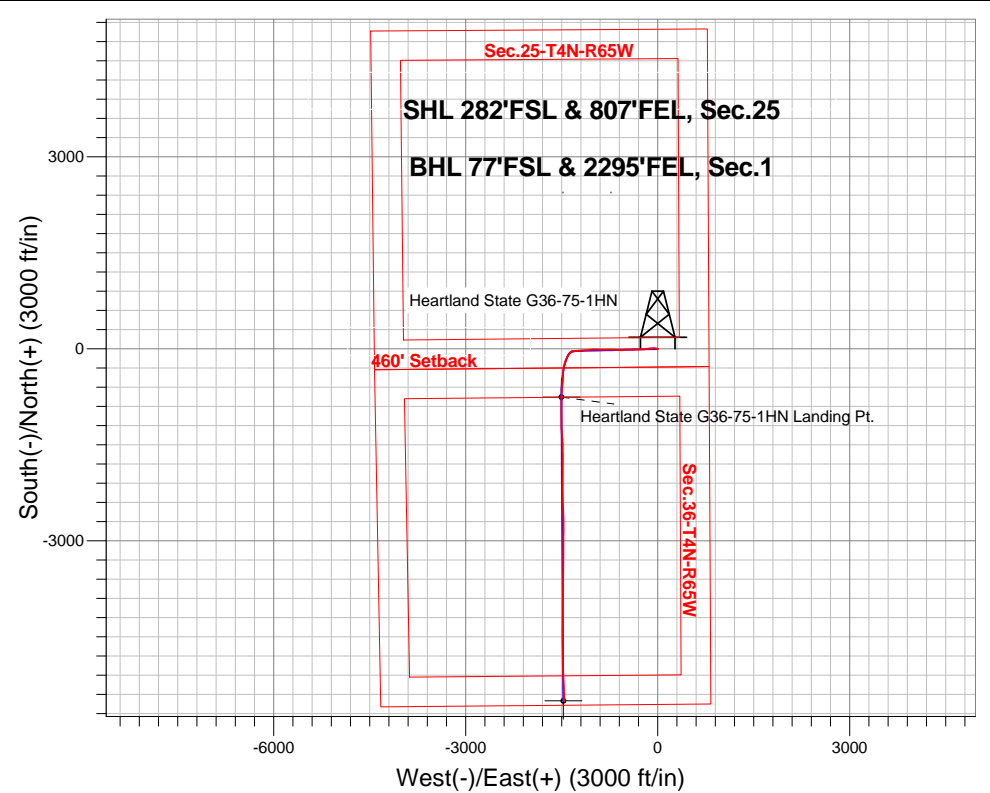
Ground Elevation: 4834.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1344913.63	3249651.60	40.276730	-104.605230	

Precision 829 RKB - 16' WELL @ 4850.0ft (Precision 829 RKB - 16')

FINAL SURVEY

Projected Bottom Hole Location
12323'MD 6986'TVD 5496'S & 1459'W of
SHL 90.1 degree Incl @ 177.4 degree AZM





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

Sec.25-T4N-R65W

Heartland State G36-75-1HN Pad Sec.25-T4N-R65W

Heartland State G36-75-1HN

Wellbore #1

Design: Wellbore #1

Final Survey

04 August, 2014

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State G36-75-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Well:	Heartland State G36-75-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	Sec.25-T4N-R65W, Weld County, CO		
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	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W				
Site Position:		Northing:	1,344,913.65 ft	Latitude:	40.276730
From:	Lat/Long	Easting:	3,249,651.60 ft	Longitude:	-104.605230
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.58 °

Well	Heartland State G36-75-1HN					
Well Position	+N/-S	0.0 ft	Northing:	1,344,913.63 ft	Latitude:	40.276730
	+E/-W	0.0 ft	Easting:	3,249,651.60 ft	Longitude:	-104.605230
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,834.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/2/2014	8.37	66.87	52,771

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	195.01	

Survey Program	Date	8/4/2014			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
352.0	744.0	Surface (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
788.0	7,538.0	Intermediate/Curve (Wellbore #1)	MWD	MWD - Standard	
7,621.0	12,323.0	Lateral (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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	
352.0	0.50	259.61	352.0	-0.3	-1.5	0.7	0.14	
744.0	0.10	158.91	744.0	-0.9	-3.1	1.7	0.13	
788.0	0.70	171.70	788.0	-1.2	-3.0	1.9	1.37	
877.0	0.80	154.40	877.0	-2.3	-2.7	2.9	0.28	
967.0	0.60	166.40	967.0	-3.3	-2.3	3.8	0.27	
1,057.0	0.80	269.30	1,057.0	-3.8	-2.8	4.4	1.22	
1,165.0	2.30	304.90	1,164.9	-2.6	-5.3	3.9	1.59	
1,260.0	4.20	295.10	1,259.8	0.0	-10.1	2.6	2.08	
1,358.0	5.60	293.90	1,357.4	3.5	-17.7	1.2	1.43	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State G36-75-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Well:	Heartland State G36-75-1HN	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)
1,452.0	8.70	286.90	1,450.7	7.4	-28.7	0.3	3.42
1,546.0	10.50	279.50	1,543.4	10.9	-43.9	0.9	2.32
1,640.0	11.20	266.30	1,635.7	11.7	-61.5	4.6	2.74
1,733.0	11.30	269.10	1,726.9	11.0	-79.6	10.0	0.60
1,827.0	12.80	266.20	1,818.8	10.1	-99.2	15.9	1.72
1,920.0	13.90	261.30	1,909.3	7.8	-120.5	23.7	1.70
2,014.0	14.80	262.70	2,000.4	4.5	-143.6	32.8	1.03
2,108.0	15.50	261.70	2,091.1	1.2	-167.9	42.3	0.79
2,201.0	15.50	262.20	2,180.7	-2.3	-192.5	52.1	0.14
2,296.0	15.70	266.20	2,272.2	-4.9	-217.9	61.1	1.15
2,389.0	15.70	268.60	2,361.8	-6.0	-243.1	68.8	0.70
2,483.0	15.60	269.30	2,452.3	-6.5	-268.4	75.8	0.23
2,590.0	15.90	270.10	2,555.3	-6.6	-297.5	83.4	0.35
2,679.0	14.80	265.50	2,641.1	-7.5	-321.0	90.4	1.84
2,769.0	14.50	263.60	2,728.2	-9.7	-343.7	98.3	0.63
2,859.0	15.80	262.60	2,815.0	-12.5	-367.0	107.1	1.47
2,948.0	16.60	268.20	2,900.5	-14.4	-391.7	115.4	1.97
3,038.0	17.00	272.50	2,986.7	-14.3	-417.7	122.0	1.45
3,127.0	16.00	270.40	3,072.0	-13.6	-443.0	127.9	1.31
3,217.0	15.00	267.70	3,158.7	-14.0	-467.0	134.5	1.37
3,307.0	14.20	271.90	3,245.8	-14.1	-489.7	140.4	1.47
3,396.0	12.60	267.70	3,332.4	-14.1	-510.3	145.8	2.10
3,486.0	12.10	262.40	3,420.3	-15.8	-529.5	152.4	1.38
3,576.0	12.00	263.50	3,508.3	-18.1	-548.1	159.4	0.28
3,665.0	13.30	273.00	3,595.2	-18.6	-567.5	164.9	2.75
3,755.0	14.10	274.30	3,682.6	-17.2	-588.8	169.1	0.95
3,845.0	14.60	275.70	3,769.8	-15.3	-611.0	173.0	0.68
3,935.0	15.90	276.40	3,856.6	-12.8	-634.6	176.7	1.46
4,024.0	17.30	274.40	3,941.9	-10.4	-659.9	180.9	1.70
4,114.0	18.60	271.10	4,027.6	-9.1	-687.6	186.8	1.83
4,203.0	18.00	268.00	4,112.1	-9.3	-715.5	194.3	1.28
4,293.0	16.70	265.70	4,198.0	-10.8	-742.3	202.6	1.63
4,383.0	16.30	263.70	4,284.3	-13.1	-767.8	211.5	0.77
4,472.0	16.10	269.20	4,369.7	-14.7	-792.5	219.4	1.74
4,562.0	16.10	273.30	4,456.2	-14.1	-817.4	225.3	1.26
4,651.0	17.10	274.20	4,541.5	-12.5	-842.8	230.3	1.16
4,741.0	16.50	271.90	4,627.7	-11.1	-868.8	235.7	0.99
4,831.0	15.00	268.80	4,714.3	-10.9	-893.2	241.8	1.91
4,920.0	15.60	270.80	4,800.1	-11.0	-916.7	248.0	0.90
5,010.0	16.10	272.20	4,886.7	-10.3	-941.3	253.7	0.70
5,100.0	16.20	272.30	4,973.1	-9.3	-966.3	259.2	0.12
5,189.0	16.40	269.60	5,058.6	-8.9	-991.2	265.3	0.88
5,279.0	17.80	265.90	5,144.6	-10.0	-1,017.7	273.2	1.97
5,369.0	15.90	263.80	5,230.7	-12.3	-1,043.6	282.1	2.22
5,458.0	15.20	262.00	5,316.5	-15.2	-1,067.3	291.1	0.96

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State G36-75-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Well:	Heartland State G36-75-1HN	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)
5,548.0	13.10	261.10	5,403.7	-18.5	-1,089.1	299.9	2.35
5,637.0	13.90	268.70	5,490.3	-20.3	-1,109.7	307.0	2.18
5,727.0	14.80	264.00	5,577.5	-21.7	-1,132.0	314.1	1.63
5,817.0	14.70	266.00	5,664.5	-23.7	-1,154.8	321.9	0.58
5,906.0	15.70	266.60	5,750.4	-25.2	-1,178.1	329.4	1.14
5,996.0	13.60	270.30	5,837.5	-25.9	-1,200.8	336.0	2.55
6,086.0	14.00	264.20	5,924.9	-26.9	-1,222.2	342.5	1.68
6,175.0	14.20	265.30	6,011.2	-28.9	-1,243.8	350.0	0.38
6,265.0	14.80	266.40	6,098.3	-30.5	-1,266.3	357.4	0.73
6,355.0	15.30	263.50	6,185.2	-32.6	-1,289.6	365.4	1.00
6,444.0	15.60	259.90	6,271.0	-36.0	-1,313.0	374.8	1.13
6,489.0	17.50	252.60	6,314.2	-39.1	-1,325.4	381.0	6.25
6,534.0	20.80	244.10	6,356.7	-44.6	-1,339.1	389.9	9.58
6,579.0	22.30	236.30	6,398.5	-52.9	-1,353.4	401.5	7.18
6,623.0	23.20	229.30	6,439.1	-63.1	-1,366.9	415.0	6.48
6,668.0	24.40	221.10	6,480.3	-75.9	-1,379.7	430.6	7.82
6,713.0	27.70	213.30	6,520.7	-91.7	-1,391.6	448.9	10.56
6,757.0	30.50	209.00	6,559.2	-110.0	-1,402.6	469.5	7.94
6,802.0	30.60	205.40	6,597.9	-130.3	-1,413.1	491.8	4.07
6,847.0	30.40	204.80	6,636.7	-151.0	-1,422.8	514.3	0.81
6,891.0	33.10	202.80	6,674.1	-172.2	-1,432.1	537.2	6.59
6,936.0	37.10	200.40	6,710.9	-196.3	-1,441.6	562.9	9.40
6,981.0	42.10	197.50	6,745.6	-223.4	-1,450.9	591.5	11.84
7,026.0	48.00	195.10	6,777.4	-254.0	-1,459.8	623.3	13.64
7,071.0	53.50	191.00	6,805.8	-287.9	-1,467.6	658.1	14.11
7,115.0	56.00	187.30	6,831.2	-323.3	-1,473.3	693.8	8.91
7,160.0	58.90	182.90	6,855.5	-361.1	-1,476.6	731.2	10.46
7,205.0	59.80	182.10	6,878.4	-399.8	-1,478.3	769.0	2.52
7,250.0	62.90	183.00	6,900.0	-439.2	-1,480.1	807.5	7.11
7,295.0	65.40	183.80	6,919.6	-479.7	-1,482.5	847.2	5.78
7,339.0	68.90	184.90	6,936.7	-520.1	-1,485.6	887.0	8.28
7,384.0	71.30	186.10	6,952.0	-562.2	-1,489.6	928.8	5.89
7,429.0	76.80	185.70	6,964.4	-605.2	-1,494.1	971.5	12.25
7,473.0	82.80	184.30	6,972.1	-648.3	-1,497.8	1,014.1	13.99
7,538.0	91.60	181.10	6,975.3	-713.1	-1,500.9	1,077.5	14.40
7,576.9	91.08	180.77	6,974.4	-752.0	-1,501.5	1,115.2	1.57
Heartland State G36-75-1HN Landing Pt.							
7,621.0	90.50	180.40	6,973.8	-796.1	-1,502.0	1,157.9	1.57
7,711.0	88.70	180.80	6,974.4	-886.1	-1,502.9	1,245.0	2.05
7,801.0	88.50	180.40	6,976.6	-976.0	-1,503.8	1,332.2	0.50
7,891.0	89.50	180.50	6,978.2	-1,066.0	-1,504.6	1,419.3	1.12
7,979.0	89.80	180.20	6,978.7	-1,154.0	-1,505.1	1,504.4	0.48
8,069.0	90.50	177.20	6,978.5	-1,244.0	-1,503.0	1,590.8	3.42
8,159.0	90.40	174.90	6,977.8	-1,333.8	-1,496.8	1,675.9	2.56

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State G36-75-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Well:	Heartland State G36-75-1HN	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)
8,248.0	90.60	175.70	6,977.0	-1,422.5	-1,489.6	1,759.7	0.93
8,338.0	90.60	180.10	6,976.1	-1,512.4	-1,486.3	1,845.7	4.89
8,427.0	90.80	178.00	6,975.0	-1,601.4	-1,484.8	1,931.2	2.37
8,517.0	91.00	179.50	6,973.6	-1,691.3	-1,482.8	2,017.6	1.68
8,607.0	90.80	180.80	6,972.2	-1,781.3	-1,483.1	2,104.6	1.46
8,696.0	89.00	181.10	6,972.3	-1,870.3	-1,484.5	2,190.9	2.05
8,786.0	89.20	180.70	6,973.7	-1,960.3	-1,485.9	2,278.2	0.50
8,876.0	89.00	180.10	6,975.1	-2,050.3	-1,486.6	2,365.3	0.70
8,965.0	89.60	179.80	6,976.2	-2,139.2	-1,486.5	2,451.2	0.75
9,055.0	89.90	179.70	6,976.6	-2,229.2	-1,486.1	2,538.0	0.35
9,145.0	91.50	178.70	6,975.5	-2,319.2	-1,484.8	2,624.6	2.10
9,235.0	90.70	176.50	6,973.8	-2,409.1	-1,481.1	2,710.5	2.60
9,324.0	87.90	177.40	6,974.9	-2,498.0	-1,476.3	2,795.1	3.30
9,414.0	89.30	179.30	6,977.1	-2,587.9	-1,473.8	2,881.3	2.62
9,504.0	89.00	179.50	6,978.4	-2,677.9	-1,472.8	2,967.9	0.40
9,594.0	89.10	179.50	6,979.9	-2,767.9	-1,472.0	3,054.7	0.11
9,684.0	89.80	180.90	6,980.8	-2,857.9	-1,472.3	3,141.7	1.74
9,773.0	90.00	180.50	6,980.9	-2,946.9	-1,473.4	3,227.9	0.50
9,863.0	89.80	180.20	6,981.1	-3,036.9	-1,474.0	3,315.0	0.40
9,953.0	89.50	180.10	6,981.6	-3,126.9	-1,474.2	3,402.0	0.35
10,042.0	89.50	179.80	6,982.4	-3,215.9	-1,474.1	3,487.9	0.34
10,132.0	90.10	181.50	6,982.7	-3,305.8	-1,475.2	3,575.1	2.00
10,222.0	89.80	181.00	6,982.8	-3,395.8	-1,477.1	3,662.5	0.65
10,311.0	90.20	180.80	6,982.8	-3,484.8	-1,478.5	3,748.8	0.50
10,401.0	90.30	180.30	6,982.4	-3,574.8	-1,479.4	3,836.0	0.57
10,491.0	90.40	179.40	6,981.9	-3,664.8	-1,479.1	3,922.8	1.01
10,580.0	90.50	180.40	6,981.2	-3,753.8	-1,479.0	4,008.8	1.13
10,670.0	88.80	180.80	6,981.7	-3,843.8	-1,479.9	4,095.9	1.94
10,760.0	88.10	180.10	6,984.1	-3,933.8	-1,480.6	4,183.0	1.10
10,850.0	88.60	180.80	6,986.7	-4,023.7	-1,481.3	4,270.1	0.96
10,939.0	89.40	181.90	6,988.3	-4,112.7	-1,483.4	4,356.5	1.53
11,029.0	90.50	181.30	6,988.4	-4,202.6	-1,486.0	4,444.1	1.39
11,118.0	90.20	180.70	6,987.8	-4,291.6	-1,487.5	4,530.4	0.75
11,208.0	90.00	180.10	6,987.7	-4,381.6	-1,488.1	4,617.5	0.70
11,298.0	89.60	181.00	6,988.0	-4,471.6	-1,489.0	4,704.7	1.09
11,387.0	89.70	180.30	6,988.5	-4,560.6	-1,490.0	4,790.9	0.79
11,477.0	90.70	179.70	6,988.2	-4,650.6	-1,490.0	4,877.8	1.30
11,566.0	90.10	177.60	6,987.6	-4,739.6	-1,487.9	4,963.2	2.45
11,656.0	89.50	177.10	6,987.9	-4,829.5	-1,483.8	5,049.0	0.87
11,746.0	89.10	176.20	6,989.0	-4,919.3	-1,478.5	5,134.4	1.09
11,836.0	90.90	179.10	6,989.0	-5,009.2	-1,474.8	5,220.3	3.79
11,925.0	90.50	178.70	6,987.9	-5,098.2	-1,473.1	5,305.8	0.64
12,015.0	90.30	178.60	6,987.3	-5,188.2	-1,471.0	5,392.1	0.25
12,104.0	90.20	178.00	6,986.9	-5,277.1	-1,468.3	5,477.4	0.68

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Heartland State G36-75-1HN
Project:	Sec.25-T4N-R65W	TVD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Site:	Heartland State G36-75-1HN Pad Sec.25-T4N-R65W	MD Reference:	WELL @ 4850.0ft (Precision 829 RKB - 16')
Well:	Heartland State G36-75-1HN	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)
12,194.0	90.20	177.80	6,986.6	-5,367.1	-1,465.0	5,563.4	0.22
12,261.0	90.10	177.40	6,986.4	-5,434.0	-1,462.2	5,627.3	0.62
12,323.0	90.10	177.40	6,986.3	-5,495.9	-1,459.4	5,686.4	0.00
Heartland State G36-75-1HN BHL 75'FSL & 2310'FEL							

Checked By: _____ Approved By: _____ Date: _____