

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

Well Name: **Timbro LD29-78HN**

Surface Location: Timbro LD19-73HN Pad Sec.19-T9N-R58W

North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

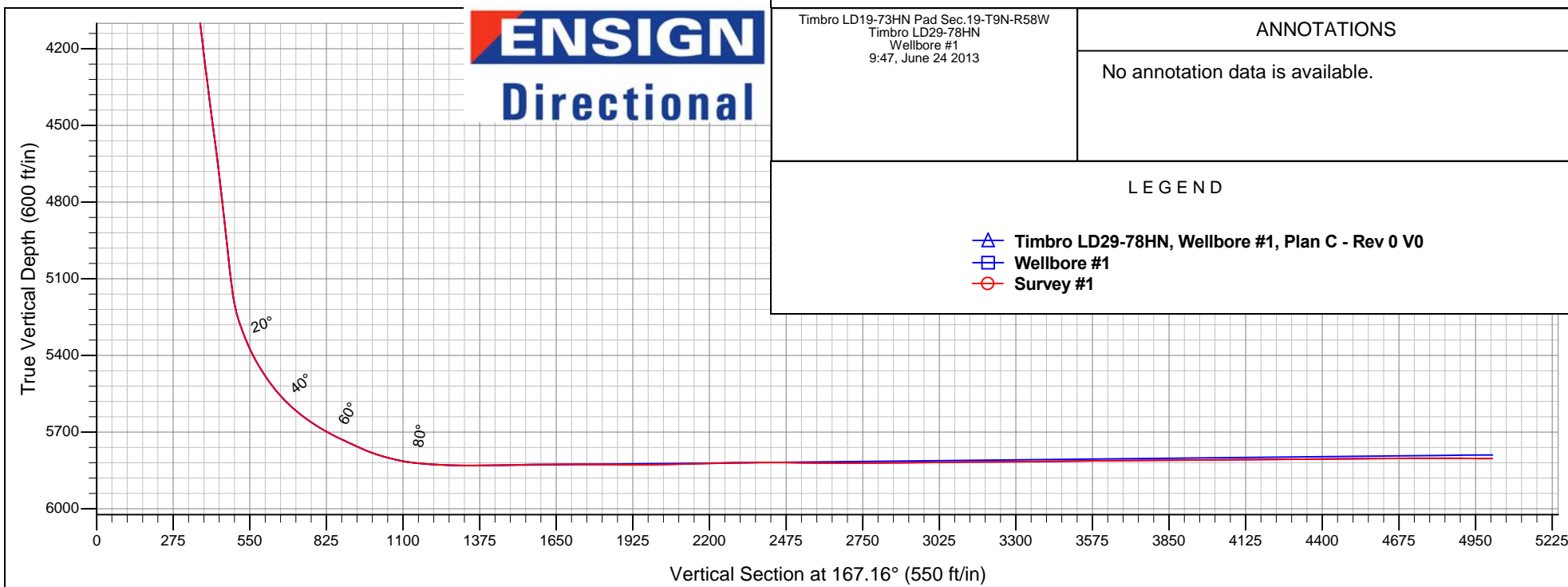
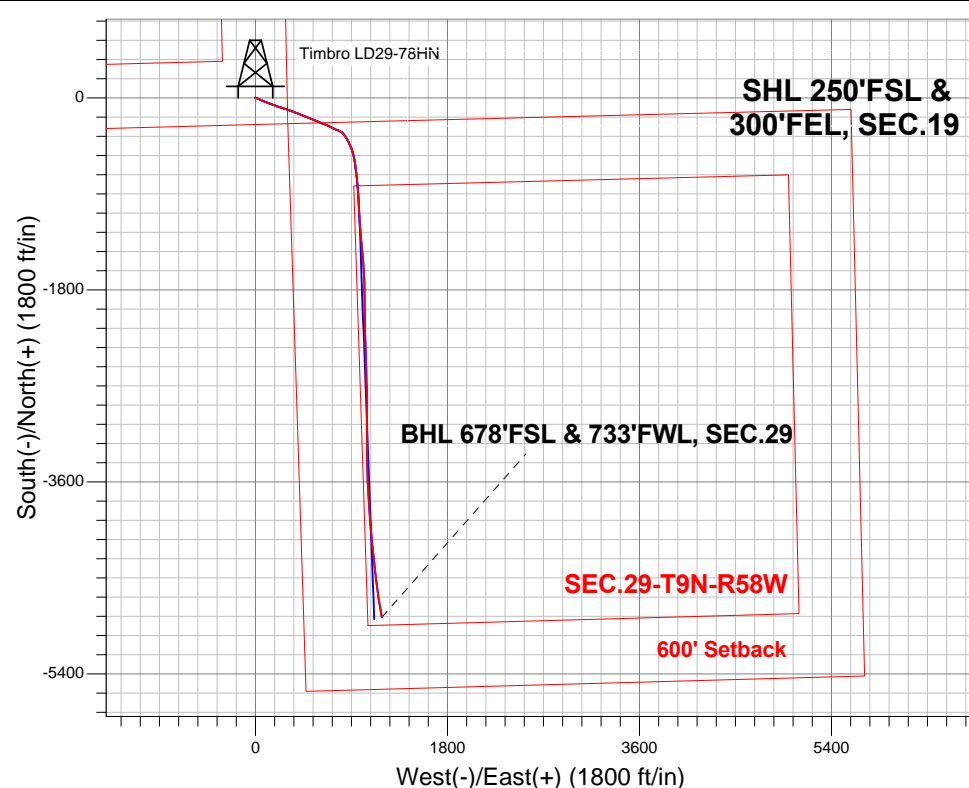
Ground Elevation: 4824.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1512762.03	3443785.69	40.729922	-103.898694	

H&P 273 RKB - 24' WELL @ 4848.0ft (H&P 273 RKB - 24')

FINAL SURVEY

Projected Bottom Hole Location
10185'MD 5803'TVD 4868'S &
1186'E of SHL 89.70 degree Incl
@ 169.20 degree AZM



Timbro LD19-73HN Pad Sec.19-T9N-R58W
Timbro LD29-78HN
Wellbore #1
9:47, June 24 2013

ANNOTATIONS

No annotation data is available.

LEGEND

- Timbro LD29-78HN, Wellbore #1, Plan C - Rev 0 V0
- Wellbore #1
- Survey #1



Directional

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

SEC.19-T9N-R58W

Timbro LD19-73HN Pad Sec.19-T9N-R58W

Timbro LD29-78HN

Wellbore #1

Survey: Survey #1

Standard Survey Report

24 June, 2013

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Timbro LD29-78HN
Project:	SEC.19-T9N-R58W	TVD Reference:	WELL @ 4848.0ft (H&P 273 RKB - 24')
Site:	Timbro LD19-73HN Pad Sec.19-T9N-R58W	MD Reference:	WELL @ 4848.0ft (H&P 273 RKB - 24')
Well:	Timbro LD29-78HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.19-T9N-R58W, 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	Timbro LD19-73HN Pad Sec.19-T9N-R58W				
Site Position:		Northing:	1,512,799.56 ft	Latitude:	40.730025
From:	Lat/Long	Easting:	3,443,785.01 ft	Longitude:	-103.898694
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	1.03 °

Well	Timbro LD29-78HN					
Well Position	+N-S	0.0 ft	Northing:	1,512,762.03 ft	Latitude:	40.729922
	+E-W	0.0 ft	Easting:	3,443,785.69 ft	Longitude:	-103.898694
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,824.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/17/2013	8.14	67.38	53,180

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	167.16

Survey Program	Date	6/24/2013			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
816.0	10,185.0	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	
816.0	0.10	90.10	816.0	0.0	0.7	0.2	0.01	0.01	0.00	
909.0	1.70	113.80	909.0	-0.6	2.1	1.0	1.73	1.72	25.48	
1,002.0	2.90	106.10	1,001.9	-1.8	5.6	3.0	1.33	1.29	-8.28	
1,095.0	4.30	101.30	1,094.7	-3.1	11.3	5.5	1.54	1.51	-5.16	
1,188.0	5.60	108.70	1,187.4	-5.2	19.0	9.3	1.55	1.40	7.96	
1,281.0	6.90	111.30	1,279.8	-8.7	28.5	14.8	1.43	1.40	2.80	
1,374.0	8.90	114.30	1,371.9	-13.7	40.2	22.3	2.20	2.15	3.23	
1,467.0	10.20	115.60	1,463.6	-20.2	54.2	31.8	1.42	1.40	1.40	
1,562.0	12.00	114.70	1,556.9	-28.0	70.8	43.0	1.90	1.89	-0.95	
1,656.0	11.90	112.90	1,648.8	-35.9	88.6	54.6	0.41	-0.11	-1.91	
1,751.0	11.70	108.50	1,741.8	-42.7	106.7	65.4	0.97	-0.21	-4.63	

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Timbro LD29-78HN
Project:	SEC.19-T9N-R58W	TVD Reference:	WELL @ 4848.0ft (H&P 273 RKB - 24')
Site:	Timbro LD19-73HN Pad Sec.19-T9N-R58W	MD Reference:	WELL @ 4848.0ft (H&P 273 RKB - 24')
Well:	Timbro LD29-78HN	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)
1,846.0	12.40	111.20	1,834.7	-49.5	125.4	76.1	0.95	0.74	2.84
1,941.0	12.80	111.00	1,927.4	-56.9	144.7	87.7	0.42	0.42	-0.21
2,036.0	13.80	111.30	2,019.9	-64.8	165.1	99.9	1.06	1.05	0.32
2,131.0	13.50	108.50	2,112.2	-72.4	186.2	112.0	0.76	-0.32	-2.95
2,226.0	12.70	106.60	2,204.7	-78.9	206.7	122.9	0.96	-0.84	-2.00
2,320.0	12.10	111.70	2,296.5	-85.5	225.8	133.6	1.33	-0.64	5.43
2,415.0	13.20	109.10	2,389.2	-92.8	245.3	144.9	1.30	1.16	-2.74
2,510.0	12.90	103.60	2,481.8	-98.8	265.8	155.4	1.34	-0.32	-5.79
2,605.0	13.80	108.90	2,574.2	-105.0	286.8	166.1	1.60	0.95	5.58
2,699.0	13.00	108.40	2,665.7	-111.9	307.5	177.5	0.86	-0.85	-0.53
2,794.0	14.00	112.20	2,758.0	-119.7	328.3	189.6	1.41	1.05	4.00
2,889.0	12.80	110.50	2,850.5	-127.7	348.8	202.0	1.33	-1.26	-1.79
2,984.0	12.90	112.10	2,943.1	-135.4	368.4	213.8	0.39	0.11	1.68
3,079.0	11.10	109.10	3,036.0	-142.3	386.9	224.7	2.00	-1.89	-3.16
3,174.0	11.80	109.90	3,129.1	-148.6	404.7	234.8	0.76	0.74	0.84
3,269.0	13.00	113.50	3,221.9	-156.2	423.6	246.4	1.50	1.26	3.79
3,364.0	13.70	112.20	3,314.3	-164.7	443.8	259.2	0.80	0.74	-1.37
3,458.0	14.30	112.40	3,405.5	-173.4	464.9	272.3	0.64	0.64	0.21
3,553.0	14.70	111.90	3,497.5	-182.3	486.9	285.9	0.44	0.42	-0.53
3,648.0	15.80	110.50	3,589.2	-191.3	510.2	299.9	1.22	1.16	-1.47
3,743.0	15.80	109.80	3,680.6	-200.3	534.5	314.0	0.20	0.00	-0.74
3,838.0	14.20	112.10	3,772.3	-209.0	557.5	327.6	1.80	-1.68	2.42
3,932.0	13.10	114.20	3,863.7	-217.7	577.9	340.7	1.28	-1.17	2.23
4,027.0	12.50	113.80	3,956.3	-226.3	597.1	353.3	0.64	-0.63	-0.42
4,122.0	12.50	113.50	4,049.1	-234.5	615.9	365.5	0.07	0.00	-0.32
4,217.0	10.80	110.30	4,142.1	-241.7	633.7	376.5	1.91	-1.79	-3.37
4,312.0	11.50	111.20	4,235.3	-248.2	650.9	386.6	0.76	0.74	0.95
4,407.0	11.10	112.60	4,328.5	-255.2	668.1	397.2	0.51	-0.42	1.47
4,501.0	11.10	113.10	4,420.7	-262.2	684.8	407.8	0.10	0.00	0.53
4,596.0	11.10	116.80	4,513.9	-269.9	701.4	419.0	0.75	0.00	3.89
4,691.0	9.90	118.60	4,607.3	-278.0	716.7	430.2	1.31	-1.26	1.89
4,786.0	9.70	117.10	4,700.9	-285.5	731.0	440.8	0.34	-0.21	-1.58
4,881.0	9.90	111.20	4,794.6	-292.1	745.8	450.5	1.08	0.21	-6.21
4,975.0	10.10	114.20	4,887.1	-298.4	760.8	460.0	0.59	0.21	3.19
5,070.0	10.20	107.50	4,980.7	-304.4	776.4	469.2	1.25	0.11	-7.05
5,156.0	10.10	117.30	5,065.3	-310.1	790.4	477.9	2.01	-0.12	11.40
5,251.0	10.00	120.30	5,158.9	-318.1	804.9	488.9	0.56	-0.11	3.16
5,298.0	12.80	134.40	5,204.9	-323.8	812.2	496.1	8.36	5.96	30.00
5,346.0	17.00	140.90	5,251.3	-333.0	820.4	506.9	9.40	8.75	13.54
5,393.0	20.20	141.80	5,295.9	-344.7	829.7	520.4	6.84	6.81	1.91
5,441.0	22.40	145.30	5,340.6	-358.7	840.1	536.4	5.29	4.58	7.29
5,488.0	25.30	145.30	5,383.6	-374.3	850.9	554.0	6.17	6.17	0.00
5,536.0	28.80	150.20	5,426.3	-392.8	862.5	574.6	8.64	7.29	10.21
5,583.0	31.50	155.10	5,466.9	-413.8	873.3	597.4	7.77	5.74	10.43
5,630.0	33.90	156.20	5,506.5	-436.9	883.8	622.3	5.26	5.11	2.34
5,677.0	38.00	156.70	5,544.5	-462.2	894.8	649.4	8.75	8.72	1.06
5,725.0	43.30	160.60	5,580.9	-491.3	906.1	680.3	12.24	11.04	8.13
5,772.0	46.70	165.80	5,614.2	-523.1	915.6	713.5	10.65	7.23	11.06
5,820.0	51.60	169.00	5,645.6	-558.5	923.5	749.7	11.38	10.21	6.67
5,867.0	55.30	171.60	5,673.6	-595.7	929.9	787.4	9.04	7.87	5.53
5,915.0	59.10	171.80	5,699.6	-635.7	935.7	827.6	7.92	7.92	0.42
5,962.0	62.40	172.70	5,722.5	-676.3	941.2	868.5	7.22	7.02	1.91
6,010.0	63.70	173.00	5,744.3	-718.7	946.5	911.1	2.77	2.71	0.63

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Timbro LD29-78HN
Project:	SEC.19-T9N-R58W	TVD Reference:	WELL @ 4848.0ft (H&P 273 RKB - 24')
Site:	Timbro LD19-73HN Pad Sec.19-T9N-R58W	MD Reference:	WELL @ 4848.0ft (H&P 273 RKB - 24')
Well:	Timbro LD29-78HN	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)
6,057.0	63.80	173.40	5,765.1	-760.6	951.5	953.0	0.79	0.21	0.85
6,105.0	69.90	173.90	5,783.9	-804.4	956.4	996.8	12.74	12.71	1.04
6,152.0	73.20	176.20	5,798.8	-848.9	960.2	1,041.0	8.42	7.02	4.89
6,199.0	77.50	176.90	5,810.7	-894.2	963.0	1,085.8	9.26	9.15	1.49
6,231.0	80.50	176.90	5,816.8	-925.6	964.7	1,116.8	9.38	9.38	0.00
6,281.0	84.90	176.90	5,823.1	-975.1	967.3	1,165.6	8.80	8.80	0.00
6,373.0	88.10	177.10	5,828.8	-1,066.8	972.2	1,256.1	3.49	3.48	0.22
6,426.5	89.17	176.59	5,830.0	-1,120.2	975.1	1,308.8	2.21	2.00	-0.95
Timbro LD19-78HN Landing Pt.									
6,468.0	90.00	176.20	5,830.3	-1,161.6	977.7	1,349.8	2.21	2.00	-0.95
6,563.0	91.10	175.00	5,829.4	-1,256.3	985.0	1,443.8	1.71	1.16	-1.26
6,658.0	91.10	174.30	5,827.6	-1,350.9	993.8	1,537.9	0.74	0.00	-0.74
6,752.0	90.40	174.80	5,826.4	-1,444.5	1,002.8	1,631.1	0.92	-0.74	0.53
6,847.0	90.00	175.50	5,826.0	-1,539.1	1,010.8	1,725.2	0.85	-0.42	0.74
6,942.0	89.30	177.40	5,826.6	-1,633.9	1,016.7	1,819.0	2.13	-0.74	2.00
7,037.0	89.40	178.30	5,827.7	-1,728.9	1,020.3	1,912.3	0.95	0.11	0.95
7,131.0	91.40	178.80	5,827.0	-1,822.8	1,022.6	2,004.5	2.19	2.13	0.53
7,226.0	91.20	180.60	5,824.9	-1,917.8	1,023.1	2,097.2	1.91	-0.21	1.89
7,321.0	91.00	179.40	5,823.1	-2,012.8	1,023.1	2,189.8	1.28	-0.21	-1.26
7,416.0	91.80	178.10	5,820.7	-2,107.7	1,025.2	2,282.8	1.61	0.84	-1.37
7,511.0	90.60	178.50	5,818.7	-2,202.7	1,028.0	2,376.0	1.33	-1.26	0.42
7,605.0	89.30	177.80	5,818.8	-2,296.6	1,031.1	2,468.3	1.57	-1.38	-0.74
7,700.0	89.10	178.50	5,820.2	-2,391.5	1,034.1	2,561.5	0.77	-0.21	0.74
7,795.0	89.80	178.70	5,821.1	-2,486.5	1,036.4	2,654.6	0.77	0.74	0.21
7,890.0	90.40	178.30	5,820.9	-2,581.5	1,038.9	2,747.8	0.76	0.63	-0.42
7,985.0	90.50	177.30	5,820.2	-2,676.4	1,042.6	2,841.1	1.06	0.11	-1.05
8,079.0	90.30	178.50	5,819.5	-2,770.3	1,046.0	2,933.5	1.29	-0.21	1.28
8,174.0	91.10	180.60	5,818.3	-2,865.3	1,046.8	3,026.3	2.37	0.84	2.21
8,269.0	90.40	180.60	5,817.1	-2,960.3	1,045.8	3,118.7	0.74	-0.74	0.00
8,364.0	90.50	181.00	5,816.3	-3,055.3	1,044.4	3,211.0	0.43	0.11	0.42
8,459.0	90.50	180.40	5,815.5	-3,150.3	1,043.3	3,303.3	0.63	0.00	-0.63
8,554.0	90.70	179.60	5,814.5	-3,245.3	1,043.3	3,395.9	0.87	0.21	-0.84
8,649.0	90.60	178.50	5,813.4	-3,340.3	1,044.9	3,488.9	1.16	-0.11	-1.16
8,743.0	90.60	178.10	5,812.5	-3,434.2	1,047.6	3,581.1	0.43	0.00	-0.43
8,838.0	90.60	177.80	5,811.5	-3,529.1	1,051.0	3,674.4	0.32	0.00	-0.32
8,933.0	90.50	177.60	5,810.6	-3,624.1	1,054.9	3,767.8	0.24	-0.11	-0.21
9,028.0	90.50	177.10	5,809.7	-3,719.0	1,059.2	3,861.3	0.53	0.00	-0.53
9,123.0	90.60	176.90	5,808.8	-3,813.8	1,064.2	3,954.9	0.24	0.11	-0.21
9,218.0	90.60	176.40	5,807.8	-3,908.7	1,069.8	4,048.6	0.53	0.00	-0.53
9,313.0	90.40	175.00	5,807.0	-4,003.4	1,076.9	4,142.6	1.49	-0.21	-1.47
9,407.0	90.30	174.10	5,806.4	-4,096.9	1,085.8	4,235.8	0.96	-0.11	-0.96
9,502.0	90.40	173.40	5,805.8	-4,191.4	1,096.2	4,330.2	0.74	0.11	-0.74
9,597.0	90.70	174.30	5,804.9	-4,285.8	1,106.3	4,424.5	1.00	0.32	0.95
9,692.0	90.40	173.80	5,804.0	-4,380.3	1,116.2	4,518.8	0.61	-0.32	-0.53
9,787.0	90.80	174.60	5,803.0	-4,474.8	1,125.8	4,613.1	0.94	0.42	0.84
9,882.0	89.70	172.00	5,802.6	-4,569.2	1,136.9	4,707.5	2.97	-1.16	-2.74
9,977.0	90.40	171.80	5,802.5	-4,663.2	1,150.3	4,802.2	0.77	0.74	-0.21
10,072.0	89.50	170.20	5,802.6	-4,757.0	1,165.1	4,897.0	1.93	-0.95	-1.68
10,135.0	89.70	169.20	5,803.0	-4,819.0	1,176.4	4,959.9	1.62	0.32	-1.59
10,185.0	89.70	169.20	5,803.3	-4,868.1	1,185.7	5,009.9	0.00	0.00	0.00
Timbro LD19-78HN BHL 660'FSL, 660'FWL									

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Timbro LD29-78HN
Project:	SEC.19-T9N-R58W	TVD Reference:	WELL @ 4848.0ft (H&P 273 RKB - 24')
Site:	Timbro LD19-73HN Pad Sec.19-T9N-R58W	MD Reference:	WELL @ 4848.0ft (H&P 273 RKB - 24')
Well:	Timbro LD29-78HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Checked By: _____	Approved By: _____	Date: _____
-------------------	--------------------	-------------