

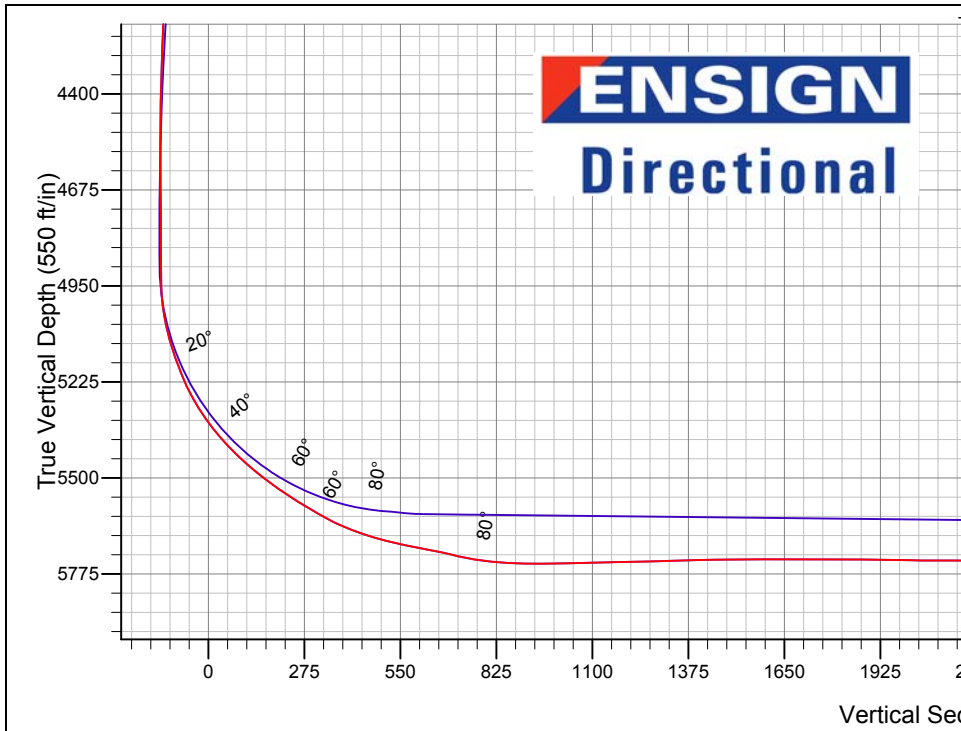
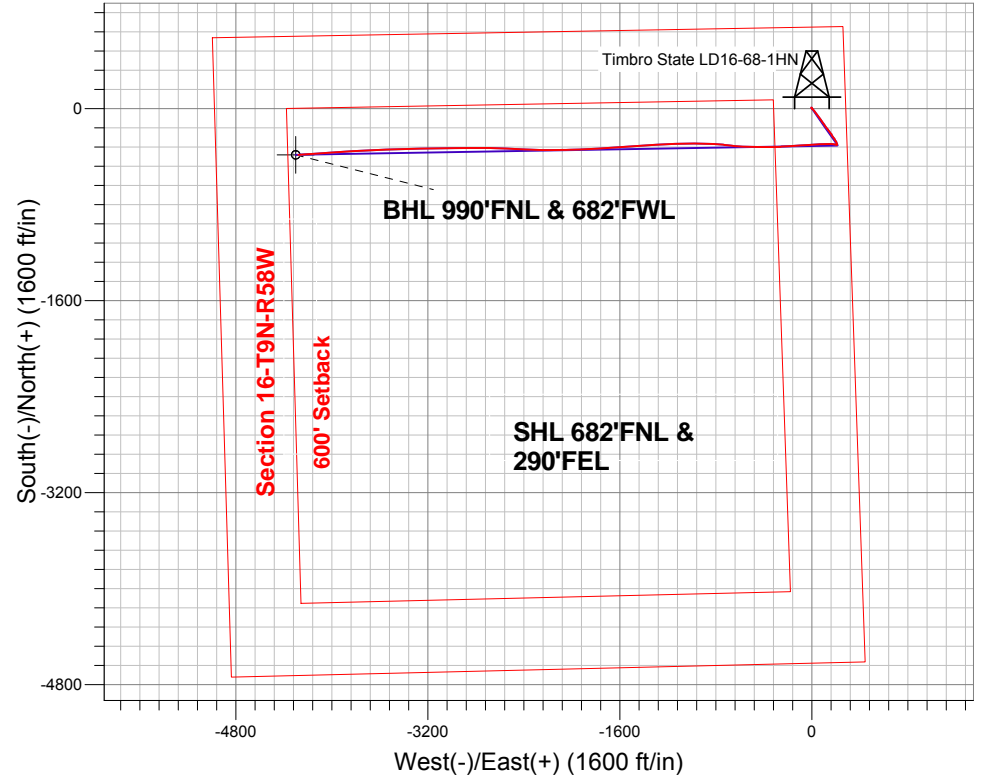
Noble Energy Inc.- Weld County, CO (Grid North)

Well Name: **Timbro State LD16-68-1HN**

Surface Location: Timbro State LD16-67HN Pad Sec.16-T9N-R58W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
 Ground Elevation: 4724.0
 +N/-S +E/-W Northing Easting Latitude Longitude Slot
 0.0 0.0 1522711.65 3454089.42 40.756710 -103.860860
 H&P 273 RKB - 24' WELL @ 4748.0ft (H&P 273 RKB - 24')

FINAL SURVEY

Projected Bottom Hole Location
 9870'MD 5736'TVD 385'S & 4279'W of SHL
 90.3 degree Incl @ 266.1 degree AZM



Timbro State LD16-67HN Pad Sec.16-T9N-R58W
 Timbro State LD16-68-1HN
 Wellbore #1
 9:35, December 05 2013

ANNOTATIONS
 No annotation data is available.

LEGEND

- Timbro State LD16-68-1HN, Wellbore #1, Plan A - Rev 0 V0
- ◇ Timbro State LD16-68-1HN, Wellbore #2, Wellbore #2 V0
- Wellbore #1



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

Sec.16-T9N-R58W

Timbro State LD16-67HN Pad Sec.16-T9N-R58W

Timbro State LD16-68-1HN

Wellbore #1

Design: Wellbore #1

Standard Survey Report

16 January, 2014

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Timbro State LD16-68-1HN
Project:	Sec.16-T9N-R58W	TVD Reference:	WELL @ 4748.0ft (H&P 273 RKB - 24')
Site:	Timbro State LD16-67HN Pad Sec.16-T9N-R58W	MD Reference:	WELL @ 4748.0ft (H&P 273 RKB - 24')
Well:	Timbro State LD16-68-1HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	Sec.16-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 State LD16-67HN Pad Sec.16-T9N-R58W				
Site Position:		Northing:	1,522,675.23ft	Latitude:	40.756610
From:	Lat/Long	Easting:	3,454,090.09ft	Longitude:	-103.860860
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	1.06 °

Well	Timbro State LD16-68-1HN					
Well Position	+N/-S	0.0 ft	Northing:	1,522,711.64 ft	Latitude:	40.756710
	+E/-W	0.0 ft	Easting:	3,454,089.42 ft	Longitude:	-103.860860
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,724.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/18/2013	8.07	67.40	53,154

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	264.88	

Survey Program	Date 1/16/2014				
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
350.0	1,200.0	Surface (Wellbore #1)	Flexi-Shot	VES Flexi-Shot Tool	
1,372.0	9,870.0	Survey #2 (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	0.00
350.0	0.10	296.50	350.0	0.1	-0.3	0.3	0.03	0.03	0.00	0.00
750.0	0.20	297.10	750.0	0.6	-1.2	1.1	0.03	0.03	0.03	0.15
1,200.0	0.50	328.80	1,200.0	2.6	-2.9	2.7	0.08	0.07	7.04	7.04
1,372.0	0.80	312.70	1,372.0	4.1	-4.2	3.8	0.20	0.17	-9.36	-9.36
1,558.0	0.80	345.80	1,558.0	6.2	-5.5	4.9	0.25	0.00	17.80	17.80
1,744.0	0.70	7.20	1,743.9	8.6	-5.6	4.9	0.16	-0.05	11.51	11.51
1,839.0	0.60	64.00	1,838.9	9.4	-5.1	4.3	0.66	-0.11	59.79	59.79
1,934.0	1.80	127.60	1,933.9	8.7	-3.5	2.7	1.71	1.26	66.95	66.95
2,028.0	4.70	135.90	2,027.8	5.1	0.4	-0.8	3.12	3.09	8.83	8.83

Company:	Noble Energy Inc.- Weld County, CO (Grid North)	Local Co-ordinate Reference:	Well Timbro State LD16-68-1HN
Project:	Sec.16-T9N-R58W	TVD Reference:	WELL @ 4748.0ft (H&P 273 RKB - 24')
Site:	Timbro State LD16-67HN Pad Sec.16-T9N-R58W	MD Reference:	WELL @ 4748.0ft (H&P 273 RKB - 24')
Well:	Timbro State LD16-68-1HN	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)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,123.0	6.40	139.60	2,122.3	-1.8	6.5	-6.3	1.83	1.79	3.89
2,218.0	7.40	145.40	2,216.6	-10.8	13.4	-12.4	1.28	1.05	6.11
2,313.0	9.50	147.10	2,310.6	-22.5	21.1	-19.0	2.23	2.21	1.79
2,408.0	9.10	144.30	2,404.3	-35.1	29.8	-26.5	0.64	-0.42	-2.95
2,502.0	8.50	143.60	2,497.2	-46.8	38.2	-33.9	0.65	-0.64	-0.74
2,597.0	9.80	141.80	2,591.0	-58.8	47.4	-42.0	1.40	1.37	-1.89
2,692.0	9.70	142.40	2,684.6	-71.5	57.3	-50.7	0.15	-0.11	0.63
2,787.0	8.80	141.10	2,778.4	-83.5	66.7	-59.0	0.97	-0.95	-1.37
2,882.0	7.50	138.90	2,872.5	-93.8	75.4	-66.7	1.41	-1.37	-2.32
2,977.0	9.00	150.30	2,966.5	-104.9	83.1	-73.4	2.33	1.58	12.00
3,071.0	9.90	144.70	3,059.2	-117.9	91.4	-80.6	1.37	0.96	-5.96
3,166.0	10.20	144.00	3,152.7	-131.4	101.1	-89.0	0.34	0.32	-0.74
3,261.0	10.00	145.50	3,246.3	-145.0	110.7	-97.4	0.35	-0.21	1.58
3,356.0	9.80	143.30	3,339.9	-158.3	120.2	-105.6	0.45	-0.21	-2.32
3,451.0	9.80	144.00	3,433.5	-171.3	129.8	-114.0	0.13	0.00	0.74
3,545.0	9.60	142.70	3,526.1	-184.0	139.3	-122.3	0.32	-0.21	-1.38
3,640.0	9.10	143.10	3,619.9	-196.3	148.6	-130.5	0.53	-0.53	0.42
3,735.0	8.40	141.00	3,713.8	-207.7	157.5	-138.3	0.81	-0.74	-2.21
3,830.0	8.40	153.80	3,807.7	-219.3	164.9	-144.7	1.96	0.00	13.47
3,925.0	6.60	149.10	3,901.9	-230.2	170.8	-149.5	2.00	-1.89	-4.95
4,019.0	7.60	141.70	3,995.2	-239.7	177.4	-155.3	1.44	1.06	-7.87
4,114.0	8.40	146.20	4,089.3	-250.4	185.1	-162.1	1.07	0.84	4.74
4,209.0	7.50	147.10	4,183.4	-261.4	192.4	-168.3	0.96	-0.95	0.95
4,304.0	6.50	149.60	4,277.7	-271.2	198.4	-173.5	1.10	-1.05	2.63
4,399.0	5.50	152.40	4,372.1	-279.9	203.3	-177.5	1.10	-1.05	2.95
4,494.0	4.40	159.20	4,466.8	-287.4	206.7	-180.2	1.31	-1.16	7.16
4,588.0	3.50	162.20	4,560.6	-293.5	208.8	-181.8	0.98	-0.96	3.19
4,683.0	2.20	195.60	4,655.4	-298.0	209.2	-181.8	2.17	-1.37	35.16
4,778.0	0.60	193.60	4,750.4	-300.2	208.6	-181.0	1.68	-1.68	-2.11
4,873.0	0.70	163.30	4,845.4	-301.3	208.7	-181.0	0.37	0.11	-31.89
4,966.0	0.60	229.00	4,938.4	-302.1	208.5	-180.7	0.76	-0.11	70.65
5,060.0	10.50	282.80	5,031.9	-300.5	199.7	-172.1	10.81	10.53	57.23
5,155.0	18.60	278.80	5,123.7	-296.3	176.3	-149.1	8.59	8.53	-4.21
5,250.0	23.00	268.60	5,212.6	-294.4	142.7	-115.9	5.98	4.63	-10.74
5,345.0	32.10	268.10	5,296.7	-295.7	98.8	-72.1	9.58	9.58	-0.53
5,440.0	40.40	266.50	5,373.2	-298.5	42.8	-16.0	8.79	8.74	-1.68
5,535.0	47.30	266.30	5,441.7	-302.6	-22.9	49.7	7.26	7.26	-0.21
5,630.0	52.80	265.90	5,502.7	-307.6	-95.5	122.5	5.80	5.79	-0.42
5,724.0	57.40	266.50	5,556.5	-312.6	-172.4	199.6	4.92	4.89	0.64
5,819.0	60.80	266.80	5,605.2	-317.4	-253.8	281.1	3.59	3.58	0.32
5,914.0	68.90	269.60	5,645.6	-320.0	-339.6	366.8	8.93	8.53	2.95
6,020.0	75.30	271.20	5,678.1	-319.3	-440.4	467.2	6.21	6.04	1.51
6,092.0	79.60	270.90	5,693.8	-318.0	-510.7	537.0	5.99	5.97	-0.42
6,154.0	79.10	271.00	5,705.2	-317.0	-571.6	597.6	0.82	-0.81	0.16
6,247.0	77.70	277.50	5,724.0	-310.3	-662.4	687.4	7.01	-1.51	6.99
6,340.0	83.70	275.30	5,739.0	-300.1	-753.6	777.3	6.86	6.45	-2.37
6,435.0	89.30	272.80	5,744.8	-293.4	-848.1	870.9	6.45	5.89	-2.63
6,530.0	90.70	269.80	5,744.8	-291.2	-943.1	965.3	3.48	1.47	-3.16
6,624.0	91.00	269.60	5,743.4	-291.7	-1,037.1	1,058.9	0.38	0.32	-0.21
6,719.0	91.50	266.60	5,741.3	-294.9	-1,132.0	1,153.8	3.20	0.53	-3.16
6,814.0	91.30	267.20	5,739.0	-300.0	-1,226.8	1,248.7	0.67	-0.21	0.63
6,909.0	91.80	267.00	5,736.4	-304.8	-1,321.6	1,343.6	0.57	0.53	-0.21
7,004.0	90.70	266.60	5,734.4	-310.1	-1,416.5	1,438.5	1.23	-1.16	-0.42

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Well:	Timbro State LD16-68-1HN	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)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
7,099.0	90.30	266.50	5,733.5	-315.8	-1,511.3	1,533.4	0.43	-0.42	-0.11	
7,194.0	90.00	265.90	5,733.3	-322.1	-1,606.1	1,628.4	0.71	-0.32	-0.63	
7,289.0	90.00	266.60	5,733.3	-328.3	-1,700.9	1,723.4	0.74	0.00	0.74	
7,384.0	89.70	267.40	5,733.5	-333.3	-1,795.7	1,818.3	0.90	-0.32	0.84	
7,479.0	89.40	267.70	5,734.3	-337.4	-1,890.7	1,913.2	0.45	-0.32	0.32	
7,574.0	88.90	267.20	5,735.7	-341.6	-1,985.6	2,008.1	0.74	-0.53	-0.53	
7,669.0	90.10	269.30	5,736.5	-344.5	-2,080.5	2,102.9	2.55	1.26	2.21	
7,763.0	89.30	268.80	5,737.0	-346.0	-2,174.5	2,196.7	1.00	-0.85	-0.53	
7,858.0	91.50	272.40	5,736.3	-345.1	-2,269.5	2,291.2	4.44	2.32	3.79	
7,953.0	91.60	272.40	5,733.8	-341.1	-2,364.3	2,385.3	0.11	0.11	0.00	
8,048.0	91.50	272.40	5,731.2	-337.1	-2,459.2	2,479.5	0.11	-0.11	0.00	
8,142.0	91.00	272.10	5,729.2	-333.4	-2,553.1	2,572.7	0.62	-0.53	-0.32	
8,237.0	90.80	271.60	5,727.7	-330.3	-2,648.1	2,667.0	0.57	-0.21	-0.53	
8,332.0	91.50	271.00	5,725.8	-328.2	-2,743.0	2,761.4	0.97	0.74	-0.63	
8,427.0	89.80	269.80	5,724.7	-327.5	-2,838.0	2,855.9	2.19	-1.79	-1.26	
8,522.0	89.30	269.50	5,725.4	-328.1	-2,933.0	2,950.6	0.61	-0.53	-0.32	
8,616.0	89.60	269.10	5,726.3	-329.3	-3,027.0	3,044.3	0.53	0.32	-0.43	
8,711.0	89.30	268.80	5,727.2	-331.0	-3,122.0	3,139.0	0.45	-0.32	-0.32	
8,806.0	89.50	268.20	5,728.2	-333.5	-3,216.9	3,233.9	0.67	0.21	-0.63	
8,901.0	89.30	268.80	5,729.2	-336.0	-3,311.9	3,328.7	0.67	-0.21	0.63	
8,995.0	89.80	269.10	5,730.0	-337.7	-3,405.9	3,422.4	0.62	0.53	0.32	
9,090.0	89.60	268.20	5,730.5	-339.9	-3,500.8	3,517.2	0.97	-0.21	-0.95	
9,185.0	89.60	267.40	5,731.1	-343.6	-3,595.8	3,612.1	0.84	0.00	-0.84	
9,280.0	89.80	267.50	5,731.6	-347.8	-3,690.7	3,707.0	0.24	0.21	0.11	
9,375.0	89.10	267.00	5,732.5	-352.4	-3,785.6	3,801.9	0.91	-0.74	-0.53	
9,469.0	89.00	266.30	5,734.1	-357.9	-3,879.4	3,895.8	0.75	-0.11	-0.74	
9,564.0	89.00	266.10	5,735.7	-364.1	-3,974.2	3,990.8	0.21	0.00	-0.21	
9,659.0	90.00	266.30	5,736.6	-370.4	-4,068.9	4,085.8	1.07	1.05	0.21	
9,754.0	90.00	265.90	5,736.6	-376.9	-4,163.7	4,180.7	0.42	0.00	-0.42	
9,800.0	90.30	266.10	5,736.5	-380.1	-4,209.6	4,226.7	0.78	0.65	0.43	
9,870.0	90.30	266.10	5,736.1	-384.9	-4,279.5	4,296.7	0.00	0.00	0.00	
Timbro State LD16-68-1HN BHL 990'FNL & 660'FWL										

Checked By: _____	Approved By: _____	Date: _____
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