





Directional

**NOBLE ENERGY INC WELD
COUNTY CO**

SEC.27-T3N-R64W

Rhino D27-20D Pad Sec.27-T3N-R64W

Rhino D27-20D

Wellbore #1

Survey: Survey #1

Standard Survey Report

15 August, 2011



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Rhino D27-20D
Project:	SEC.27-T3N-R64W	TVD Reference:	WELL @ 4879.0ft (Original Well Elev)
Site:	Rhino D27-20D Pad Sec.27-T3N-R64W	MD Reference:	WELL @ 4879.0ft (Original Well Elev)
Well:	Rhino D27-20D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.27-T3N-R64W, 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	Rhino D27-20D Pad Sec.27-T3N-R64W				
Site Position:		Northing:	1,315,786.36 ft	Latitude:	40.196230
From:	Lat/Long	Easting:	3,268,687.89 ft	Longitude:	-104.538140
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.62 °

Well	Rhino D27-20D					
Well Position	+N/-S	0.0 ft	Northing:	1,315,786.35 ft	Latitude:	40.196230
	+E/-W	0.0 ft	Easting:	3,268,687.89 ft	Longitude:	-104.538140
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,866.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	8/1/2011	8.71	66.92	53,035

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.0	0.0	0.0	276.68	

Survey Program	Date 8/15/2011				
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
838.0	7,341.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

Survey									
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Vertical Section	Dogleg Rate	Build Rate	Turn Rate
(ft)	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(°/100ft)	(°/100ft)	(°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
838.0	0.00	123.70	838.0	0.0	0.0	0.0	0.00	0.00	0.00
868.0	0.20	124.40	868.0	0.0	0.0	0.0	0.67	0.67	0.00
964.0	4.30	291.90	963.9	1.2	-3.2	3.3	4.68	4.27	174.48
1,056.0	5.00	268.30	1,055.6	2.4	-10.4	10.6	2.20	0.76	-25.65
1,150.0	7.30	282.00	1,149.1	3.5	-20.3	20.6	2.89	2.45	14.57
1,245.0	9.10	281.70	1,243.1	6.3	-33.6	34.1	1.90	1.89	-0.32
1,339.0	10.70	276.10	1,335.7	8.7	-49.5	50.2	1.98	1.70	-5.96
1,432.0	12.70	278.70	1,426.8	11.2	-68.2	69.1	2.22	2.15	2.80
1,526.0	14.50	278.00	1,518.1	14.4	-90.1	91.1	1.92	1.91	-0.74
1,620.0	16.20	273.30	1,608.8	16.8	-114.8	116.0	2.24	1.81	-5.00
1,713.0	15.80	270.60	1,698.2	17.7	-140.4	141.5	0.91	-0.43	-2.90
1,806.0	15.60	272.20	1,787.7	18.3	-165.6	166.6	0.51	-0.22	1.72

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 Site: Rhino D27-20D Pad Sec.27-T3N-R64W
 Well: Rhino D27-20D
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well Rhino D27-20D
 TVD Reference: WELL @ 4879.0ft (Original Well Elev)
 MD Reference: WELL @ 4879.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 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)
1,900.0	15.60	272.00	1,878.2	19.2	-190.9	191.8	0.06	0.00	-0.21
1,994.0	15.00	275.40	1,968.9	20.8	-215.6	216.6	1.15	-0.64	3.62
2,087.0	15.70	279.40	2,058.6	24.0	-240.0	241.2	1.36	0.75	4.30
2,180.0	15.60	279.80	2,148.1	28.2	-264.7	266.2	0.16	-0.11	0.43
2,273.0	15.30	279.20	2,237.8	32.2	-289.2	291.0	0.37	-0.32	-0.65
2,367.0	15.80	279.90	2,328.3	36.4	-314.0	316.1	0.57	0.53	0.74
2,460.0	14.80	274.50	2,418.1	39.5	-338.3	340.6	1.87	-1.08	-5.81
2,554.0	15.50	276.20	2,508.8	41.8	-362.8	365.2	0.88	0.74	1.81
2,647.0	15.30	276.40	2,598.4	44.5	-387.3	389.9	0.22	-0.22	0.22
2,742.0	15.60	276.60	2,690.0	47.4	-412.5	415.2	0.32	0.32	0.21
2,835.0	16.10	275.50	2,779.5	50.1	-437.7	440.6	0.63	0.54	-1.18
2,928.0	15.90	275.90	2,868.9	52.6	-463.3	466.2	0.25	-0.22	0.43
3,022.0	15.30	275.00	2,959.4	55.0	-488.4	491.5	0.69	-0.64	-0.96
3,116.0	14.90	276.80	3,050.2	57.5	-512.8	516.0	0.66	-0.43	1.91
3,209.0	15.30	278.00	3,140.0	60.7	-536.8	540.2	0.55	0.43	1.29
3,303.0	15.20	277.10	3,230.6	63.9	-561.3	564.9	0.27	-0.11	-0.96
3,396.0	15.50	274.30	3,320.3	66.4	-585.8	589.5	0.86	0.32	-3.01
3,491.0	15.10	278.40	3,412.0	69.1	-610.7	614.6	1.21	-0.42	4.32
3,584.0	16.80	270.80	3,501.4	71.1	-636.1	640.1	2.89	1.83	-8.17
3,677.0	15.60	273.40	3,590.7	72.0	-662.0	665.9	1.51	-1.29	2.80
3,770.0	15.10	276.10	3,680.4	74.0	-686.6	690.5	0.94	-0.54	2.90
3,863.0	16.00	277.30	3,770.0	76.9	-711.3	715.5	1.03	0.97	1.29
3,957.0	17.10	278.00	3,860.1	80.5	-737.9	742.2	1.19	1.17	0.74
4,050.0	17.10	277.30	3,949.0	84.2	-765.0	769.6	0.22	0.00	-0.75
4,143.0	15.90	276.60	4,038.1	87.4	-791.2	796.0	1.31	-1.29	-0.75
4,237.0	16.20	275.90	4,128.5	90.2	-817.0	822.0	0.38	0.32	-0.74
4,331.0	16.40	274.50	4,218.7	92.6	-843.3	848.3	0.47	0.21	-1.49
4,424.0	14.90	273.30	4,308.2	94.3	-868.3	873.4	1.65	-1.61	-1.29
4,518.0	16.00	272.90	4,398.8	95.6	-893.3	898.4	1.18	1.17	-0.43
4,612.0	15.40	278.50	4,489.3	98.1	-918.6	923.8	1.73	-0.64	5.96
4,706.0	16.10	276.20	4,579.8	101.4	-943.9	949.3	1.00	0.74	-2.45
4,799.0	15.10	279.10	4,669.4	104.7	-968.7	974.3	1.36	-1.08	3.12
4,894.0	15.20	279.90	4,761.1	108.8	-993.2	999.1	0.24	0.11	0.84
4,987.0	15.70	281.00	4,850.7	113.3	-1,017.5	1,023.8	0.62	0.54	1.18
5,081.0	15.20	282.80	4,941.3	118.5	-1,042.0	1,048.7	0.74	-0.53	1.91
5,175.0	15.00	275.90	5,032.1	122.4	-1,066.2	1,073.2	1.92	-0.21	-7.34
5,269.0	13.80	275.00	5,123.1	124.7	-1,089.4	1,096.5	1.30	-1.28	-0.96
5,363.0	11.90	278.40	5,214.8	127.1	-1,110.2	1,117.4	2.17	-2.02	3.62
5,457.0	9.00	284.00	5,307.2	130.3	-1,126.9	1,134.4	3.27	-3.09	5.96
5,550.0	6.20	284.00	5,399.4	133.2	-1,138.8	1,146.6	3.01	-3.01	0.00
5,644.0	4.20	280.60	5,493.0	135.1	-1,147.2	1,155.1	2.15	-2.13	-3.62
5,737.0	1.10	266.20	5,585.9	135.7	-1,151.4	1,159.4	3.38	-3.33	-15.48
5,832.0	0.50	259.90	5,680.9	135.5	-1,152.7	1,160.7	0.64	-0.63	-6.63
5,925.0	0.70	262.70	5,773.9	135.4	-1,153.7	1,161.6	0.22	0.22	3.01
5,951.1	0.73	261.90	5,800.0	135.3	-1,154.0	1,161.9	0.11	0.11	-3.07
TARGET BHL 2555'FNL, 1320'FWL									
6,018.0	0.80	260.10	5,866.9	135.2	-1,154.9	1,162.8	0.11	0.11	-2.69
6,111.0	0.80	267.80	5,959.9	135.1	-1,156.2	1,164.0	0.12	0.00	8.28
6,205.0	1.10	259.70	6,053.8	134.9	-1,157.7	1,165.5	0.35	0.32	-8.62
6,297.0	1.20	248.70	6,145.8	134.4	-1,159.5	1,167.2	0.26	0.11	-11.96
6,390.0	1.20	238.60	6,238.8	133.5	-1,161.2	1,168.9	0.23	0.00	-10.86
6,484.0	1.40	222.30	6,332.8	132.1	-1,162.8	1,170.3	0.45	0.21	-17.34
6,577.0	1.20	221.20	6,425.8	130.6	-1,164.2	1,171.5	0.22	-0.22	-1.18
6,671.0	0.20	192.20	6,519.7	129.7	-1,164.9	1,172.1	1.10	-1.06	-30.85

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6,764.0	1.00	94.00	6,612.7	129.5	-1,164.1	1,171.3	1.13	0.86	-105.59
6,858.0	1.80	85.00	6,706.7	129.5	-1,161.9	1,169.0	0.88	0.85	-9.57
6,906.6	1.57	93.12	6,755.3	129.6	-1,160.4	1,167.6	0.68	-0.47	16.72
TARGET CIRCLE 2555'FNL, 1320'FWL									
6,952.0	1.40	102.90	6,800.7	129.4	-1,159.3	1,166.4	0.68	-0.38	21.53
7,047.0	2.90	158.30	6,895.6	126.9	-1,157.2	1,164.1	2.53	1.58	58.32
7,140.0	3.00	175.50	6,988.5	122.3	-1,156.2	1,162.6	0.95	0.11	18.49
7,233.0	3.30	174.50	7,081.4	117.2	-1,155.7	1,161.5	0.33	0.32	-1.08
7,289.0	3.40	172.70	7,137.3	114.0	-1,155.4	1,160.8	0.26	0.18	-3.21
7,341.0	3.40	172.70	7,189.2	110.9	-1,155.0	1,160.0	0.00	0.00	0.00
HARD LINES 85'S OF BHL									

Checked By: _____ Approved By: _____ Date: _____