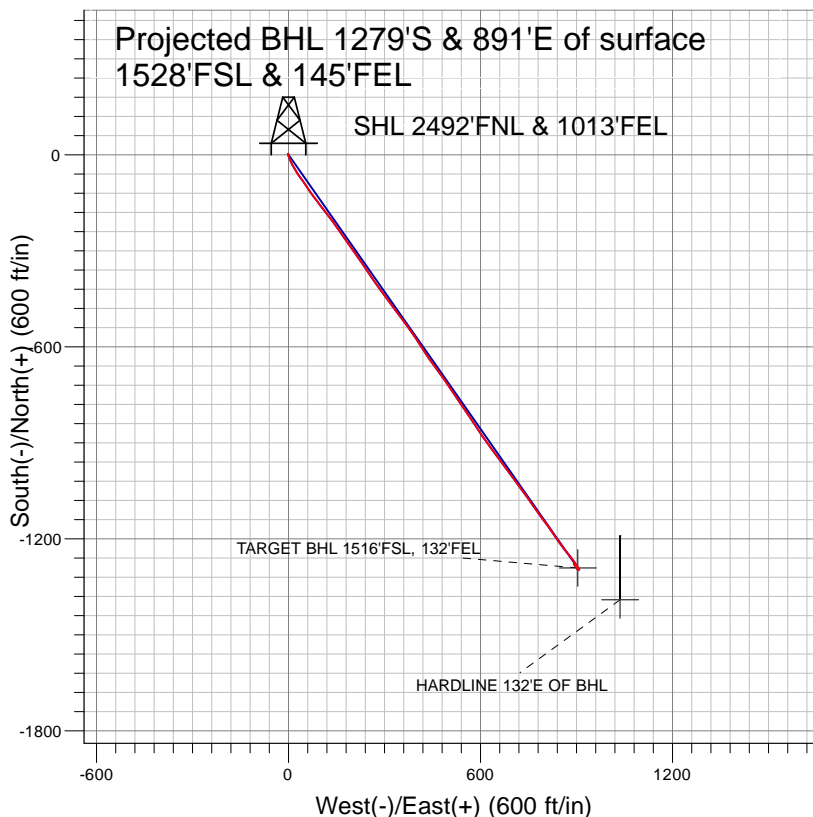


NOBLE ENERGY INC WELD COUNTY CO



LEGEND

- Horse Iron P22-33D, Wellbore #1, Plan #2 (7-22-09) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7979'MD & 7730'TVD @ 1559' VS
1.6 deg Inc 322.1 deg AZ

Project: SEC.21-T3N-R67W
Site: Horse Iron Pad Sec.21-T3N-R67W
Well: Horse Iron P22-33D
Plan: Wellbore #1



NOBLE ENERGY INC WELD COUNTY CO

SEC.21-T3N-R67W

Horse Iron Pad Sec.21-T3N-R67W

Horse Iron P22-33D

Wellbore #1

Survey: Survey #1

Standard Survey Report

31 August, 2010



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Horse Iron P22-33D
Project:	SEC.21-T3N-R67W	TVD Reference:	WELL @ 4803.0ft (Original Well Elev)
Site:	Horse Iron Pad Sec.21-T3N-R67W	MD Reference:	WELL @ 4803.0ft (Original Well Elev)
Well:	Horse Iron P22-33D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM den0-adp01 Server Data

Project	SEC.21-T3N-R67W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site	Horse Iron Pad Sec.21-T3N-R67W		
Site Position:		Northing:	1,320,540.31 ft
From:	Lat/Long	Easting:	3,170,462.46 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40° 12' 42.012 N
		Longitude:	104° 53' 22.704 W
		Grid Convergence:	0.39 °

Well	Horse Iron P22-33D		
Well Position	+N/-S	0.0 ft	Northing: 1,320,540.30 ft
	+E/-W	0.0 ft	Easting: 3,170,462.46 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	40° 12' 42.012 N
		Longitude:	104° 53' 22.704 W
		Ground Level:	4,790.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	6/26/2009	9.14	66.95	53,245

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	145.13	

Survey Program	Date	8/31/2010			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
604.0	7,979.0	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	
604.0	0.60	331.40	604.0	2.8	-1.5	-3.1	0.10	0.10	0.00	
688.0	0.60	201.40	688.0	2.8	-1.9	-3.3	1.29	0.00	-154.76	
775.0	1.60	170.00	775.0	1.1	-1.8	-2.0	1.30	1.15	-36.09	
861.0	3.40	162.30	860.9	-2.5	-0.9	1.5	2.12	2.09	-8.95	
946.0	5.20	158.30	945.6	-8.5	1.3	7.7	2.15	2.12	-4.71	
1,032.0	7.30	158.10	1,031.1	-17.2	4.8	16.8	2.44	2.44	-0.23	
1,118.0	8.80	153.60	1,116.3	-28.1	9.8	28.7	1.89	1.74	-5.23	
1,204.0	10.90	148.80	1,201.0	-41.0	16.9	43.3	2.62	2.44	-5.58	
1,289.0	12.20	148.10	1,284.3	-55.5	25.8	60.3	1.54	1.53	-0.82	
1,375.0	13.00	144.00	1,368.2	-71.0	36.3	79.0	1.39	0.93	-4.77	
1,461.0	13.70	144.80	1,451.9	-87.2	47.9	98.9	0.84	0.81	0.93	
1,546.0	15.30	146.50	1,534.2	-104.7	59.9	120.1	1.95	1.88	2.00	

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Horse Iron P22-33D
Project:	SEC.21-T3N-R67W	TVD Reference:	WELL @ 4803.0ft (Original Well Elev)
Site:	Horse Iron Pad Sec.21-T3N-R67W	MD Reference:	WELL @ 4803.0ft (Original Well Elev)
Well:	Horse Iron P22-33D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM den0-adp01 Server Data

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)
1,632.0	16.30	144.80	1,616.9	-124.1	73.1	143.6	1.28	1.16	-1.98
1,718.0	18.00	141.40	1,699.1	-144.3	88.3	168.9	2.29	1.98	-3.95
1,803.0	19.40	142.80	1,779.6	-165.8	105.1	196.1	1.73	1.65	1.65
1,889.0	19.40	143.40	1,860.7	-188.7	122.2	224.7	0.23	0.00	0.70
1,975.0	19.80	142.40	1,941.8	-211.7	139.6	253.5	0.61	0.47	-1.16
2,060.0	20.40	145.10	2,021.6	-235.2	156.9	282.7	1.30	0.71	3.18
2,146.0	20.40	145.10	2,102.2	-259.8	174.0	312.6	0.00	0.00	0.00
2,232.0	20.30	145.60	2,182.8	-284.4	191.0	342.6	0.23	-0.12	0.58
2,317.0	20.20	144.40	2,262.6	-308.5	207.9	372.0	0.50	-0.12	-1.41
2,403.0	19.70	144.80	2,343.4	-332.4	224.9	401.3	0.60	-0.58	0.47
2,489.0	20.30	146.00	2,424.2	-356.6	241.6	430.7	0.85	0.70	1.40
2,574.0	21.50	145.60	2,503.6	-381.7	258.6	461.0	1.42	1.41	-0.47
2,660.0	22.30	145.00	2,583.4	-408.1	276.9	493.1	0.97	0.93	-0.70
2,746.0	22.00	144.60	2,663.1	-434.6	295.6	525.5	0.39	-0.35	-0.47
2,832.0	20.10	142.10	2,743.3	-459.4	314.0	556.4	2.44	-2.21	-2.91
2,917.0	20.20	142.80	2,823.1	-482.6	331.9	585.7	0.31	0.12	0.82
3,003.0	19.40	144.10	2,904.0	-506.0	349.2	614.8	1.06	-0.93	1.51
3,089.0	19.10	144.10	2,985.2	-529.0	365.8	643.1	0.35	-0.35	0.00
3,174.0	18.10	143.90	3,065.8	-550.9	381.8	670.2	1.18	-1.18	-0.24
3,260.0	18.60	145.60	3,147.4	-573.0	397.4	697.3	0.85	0.58	1.98
3,346.0	18.60	148.70	3,228.9	-596.0	412.3	724.7	1.15	0.00	3.60
3,431.0	18.50	146.60	3,309.5	-618.9	426.7	751.7	0.79	-0.12	-2.47
3,517.0	17.50	145.60	3,391.3	-640.9	441.5	778.3	1.22	-1.16	-1.16
3,602.0	18.50	143.30	3,472.1	-662.3	456.8	804.6	1.44	1.18	-2.71
3,688.0	19.00	143.00	3,553.6	-684.4	473.4	832.2	0.59	0.58	-0.35
3,773.0	18.70	145.80	3,634.0	-706.7	489.4	859.6	1.12	-0.35	3.29
3,859.0	20.10	146.10	3,715.1	-730.4	505.4	888.2	1.63	1.63	0.35
3,945.0	19.00	147.10	3,796.2	-754.4	521.2	917.0	1.34	-1.28	1.16
4,030.0	19.10	145.30	3,876.5	-777.5	536.7	944.7	0.70	0.12	-2.12
4,116.0	18.50	144.30	3,957.9	-800.1	552.6	972.4	0.79	-0.70	-1.16
4,201.0	17.60	147.80	4,038.8	-821.9	567.3	998.7	1.66	-1.06	4.12
4,287.0	17.30	145.60	4,120.8	-843.5	581.5	1,024.5	0.84	-0.35	-2.56
4,373.0	18.40	146.30	4,202.7	-865.3	596.3	1,050.9	1.30	1.28	0.81
4,458.0	19.40	144.40	4,283.1	-888.0	611.9	1,078.4	1.38	1.18	-2.24
4,544.0	19.70	144.10	4,364.1	-911.3	628.7	1,107.2	0.37	0.35	-0.35
4,627.0	18.90	144.10	4,442.4	-933.6	644.8	1,134.6	0.96	-0.96	0.00
4,712.0	19.10	143.60	4,522.8	-955.9	661.1	1,162.3	0.30	0.24	-0.59
4,798.0	19.10	142.80	4,604.1	-978.4	678.0	1,190.4	0.30	0.00	-0.93
4,884.0	20.50	143.80	4,685.0	-1,001.8	695.4	1,219.5	1.67	1.63	1.16
4,969.0	19.80	144.20	4,764.8	-1,025.5	712.6	1,248.8	0.84	-0.82	0.47
5,055.0	19.00	143.40	4,845.9	-1,048.5	729.5	1,277.3	0.98	-0.93	-0.93
5,141.0	18.40	144.10	4,927.4	-1,070.8	745.8	1,304.9	0.74	-0.70	0.81
5,226.0	18.70	145.40	5,008.0	-1,092.9	761.4	1,331.9	0.60	0.35	1.53
5,312.0	19.10	145.00	5,089.3	-1,115.7	777.3	1,359.8	0.49	0.47	-0.47
5,398.0	19.00	143.10	5,170.6	-1,138.5	793.8	1,387.9	0.73	-0.12	-2.21
5,483.0	18.10	143.40	5,251.2	-1,160.1	809.9	1,414.9	1.06	-1.06	0.35
5,569.0	16.50	145.20	5,333.3	-1,180.9	824.9	1,440.4	1.96	-1.86	2.09
5,655.0	14.90	145.90	5,416.1	-1,200.1	838.1	1,463.7	1.87	-1.86	0.81
5,740.0	13.50	144.90	5,498.5	-1,217.2	849.9	1,484.6	1.67	-1.65	-1.18
5,826.0	11.20	141.20	5,582.5	-1,231.9	860.9	1,502.9	2.83	-2.67	-4.30
5,911.0	11.00	141.00	5,665.9	-1,244.7	871.2	1,519.3	0.24	-0.24	-0.24
5,997.0	9.50	141.20	5,750.5	-1,256.6	880.8	1,534.5	1.74	-1.74	0.23
6,082.0	8.40	144.20	5,834.5	-1,267.1	888.8	1,547.7	1.41	-1.29	3.53
6,168.0	6.40	146.40	5,919.8	-1,276.2	895.1	1,558.8	2.35	-2.33	2.56

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Site:	Horse Iron Pad Sec.21-T3N-R67W	MD Reference:	WELL @ 4803.0ft (Original Well Elev)
Well:	Horse Iron P22-33D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM den0-adp01 Server Data

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)	
6,254.0	5.20	148.00	6,005.3	-1,283.5	899.9	1,567.5	1.41	-1.40	1.86	
6,339.0	3.80	146.40	6,090.1	-1,289.1	903.5	1,574.2	1.65	-1.65	-1.88	
6,425.0	2.70	145.30	6,175.9	-1,293.1	906.2	1,579.0	1.28	-1.28	-1.28	
6,449.0	2.25	144.17	6,199.9	-1,294.0	906.8	1,580.1	1.88	-1.87	-4.70	
TARGET BHL 1516'FSL, 132'FEL										
6,511.0	1.10	137.00	6,261.9	-1,295.4	907.9	1,581.9	1.88	-1.86	-11.56	
6,596.0	0.70	182.50	6,346.9	-1,296.5	908.4	1,583.1	0.93	-0.47	53.53	
6,725.0	0.70	257.52	6,475.9	-1,297.5	907.6	1,583.4	0.66	0.00	58.16	
6,853.0	0.80	287.00	6,603.8	-1,297.4	906.0	1,582.4	0.31	0.08	23.03	
6,982.0	0.90	297.00	6,732.8	-1,296.7	904.2	1,580.8	0.14	0.08	7.75	
7,110.0	1.00	318.00	6,860.8	-1,295.4	902.6	1,578.8	0.28	0.08	16.41	
7,238.0	1.20	317.00	6,988.8	-1,293.6	900.9	1,576.4	0.16	0.16	-0.78	
7,366.0	1.10	335.00	7,116.8	-1,291.5	899.5	1,573.9	0.29	-0.08	14.06	
7,495.0	1.10	335.00	7,245.7	-1,289.2	898.5	1,571.4	0.00	0.00	0.00	
7,623.0	1.30	325.80	7,373.7	-1,286.9	897.1	1,568.7	0.22	0.16	-7.19	
7,752.0	1.60	323.00	7,502.7	-1,284.3	895.2	1,565.5	0.24	0.23	-2.17	
7,880.0	1.50	321.20	7,630.6	-1,281.5	893.1	1,562.0	0.09	-0.08	-1.41	
7,934.0	1.60	322.10	7,684.6	-1,280.4	892.2	1,560.6	0.19	0.19	1.67	
7,959.5	1.60	322.10	7,710.1	-1,279.8	891.8	1,559.9	0.00	0.00	0.00	
HARDLINE 132'E OF BHL										
7,979.0	1.60	322.10	7,729.6	-1,279.4	891.4	1,559.3	0.00	0.00	0.00	

Wellbore Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude	
- hit/miss target										
- Shape										
TARGET BHL 1516'F:	0.00	0.00	6,200.0	-1,291.3	903.9	1,319,255.29	3,171,375.15	40° 12' 29.251 N	104° 53' 11.054 W	
- survey misses target center by 4.0ft at 6448.9ft MD (6199.8 TVD, -1294.0 N, 906.8 E)										
- Point										
HARDLINE 132'E OF	0.00	0.00	7,715.0	-1,391.3	1,035.9	1,319,156.23	3,171,507.87	40° 12' 28.263 N	104° 53' 9.352 W	
- survey misses target center by 182.3ft at 7959.5ft MD (7710.1 TVD, -1279.8 N, 891.8 E)										
- Polygon										
Point 1			7,715.0	0.0	0.0	1,319,156.23	3,171,507.87			
Point 2			7,715.0	200.0	0.0	1,319,356.21	3,171,506.49			

Checked By: _____	Approved By: _____	Date: _____
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