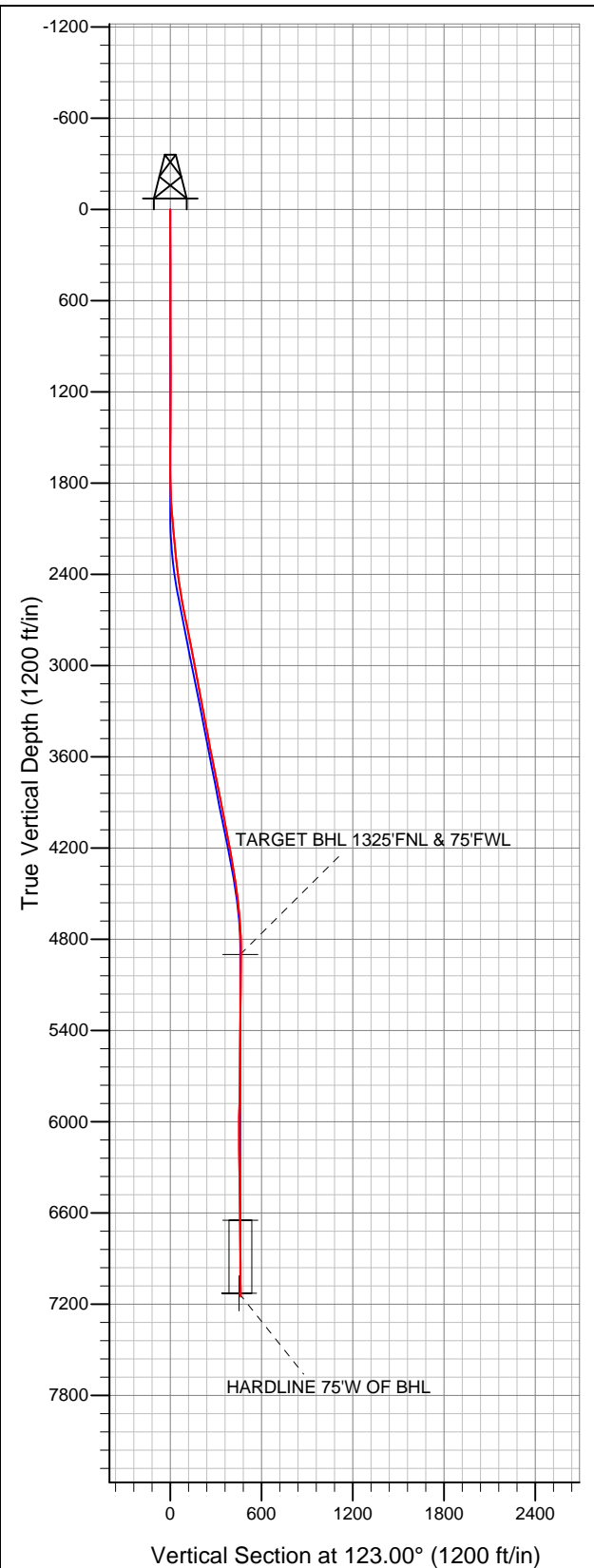


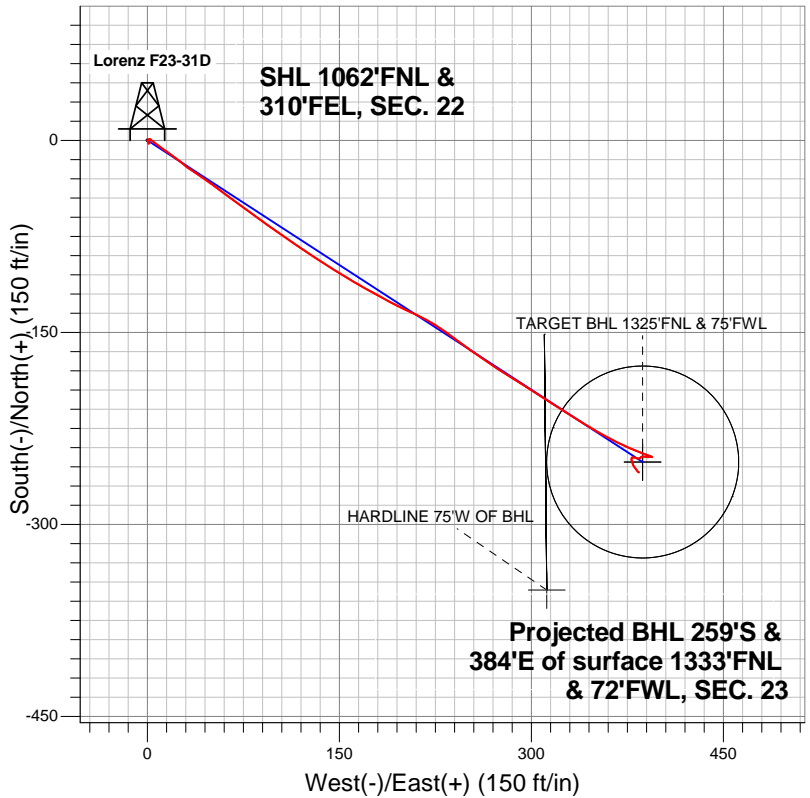
Well Name: Lorenz F23-31D

Surface Location: Lorenz Pad Sec.22-T5N-R65W
North American Datum 1983 US State Plane 1983Colorado Northern Zone
Ground Elevation: 4625.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1385701.12	3239272.79	40.388970	-104.641010	
Original Well Elev			WELL @ 4638.0ft (Original Well Elev)			



NOBLE ENERGY INC WELD COUNTY CO



LEGEND

- Wellbore #1
- Lorenz F23-31D, Wellbore #1, Noble Lorenz F23-31D Plan #1 (7-24-12) V0
- Survey #1

Final Survey Plot

Projected Final Survey -
7190'MD & 7150'TVD @ 463'VS
0.30 deg Inc 108.80 deg AZ

Project: SEC.22-T5N-R65W (Grid North)
Site: Lorenz Pad Sec.22-T5N-R65W
Well: Lorenz F23-31D
Plan: Wellbore #1



NOBLE ENERGY INC WELD COUNTY CO

**SEC.22-T5N-R65W (Grid North)
Lorenz Pad Sec.22-T5N-R65W
Lorenz F23-31D**

Wellbore #1

Survey: Survey #1

Standard Survey Report

02 August, 2012



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Lorenz F23-31D
Project:	SEC.22-T5N-R65W (Grid North)	TVD Reference:	WELL @ 4638.0ft (Original Well Elev)
Site:	Lorenz Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4638.0ft (Original Well Elev)
Well:	Lorenz F23-31D	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.22-T5N-R65W (Grid North), 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	Lorenz Pad Sec.22-T5N-R65W		
Site Position:		Northing:	1,385,744.84 ft
From:	Lat/Long	Easting:	3,239,272.37 ft
Position Uncertainty:	0.0 ft	Slot Radius:	"
		Latitude:	40.389090
		Longitude:	-104.641010
		Grid Convergence:	0.56 °

Well	Lorenz F23-31D		
Well Position	+N/-S	0.0 ft	Northing: 1,385,701.12 ft
	+E/-W	0.0 ft	Easting: 3,239,272.79 ft
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft
		Latitude:	40.388970
		Longitude:	-104.641010
		Ground Level:	4,625.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/24/2012	8.65	67.02	53,024

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	123.00	

Survey Program	Date	8/2/2012			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
136.0	7,190.0	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	
136.0	0.20	111.50	136.0	-0.1	0.2	0.2	0.15	0.15	0.00	
353.0	0.30	166.80	353.0	-0.8	0.7	1.0	0.11	0.05	25.48	
580.0	0.00	115.00	580.0	-1.4	0.8	1.4	0.13	-0.13	0.00	
686.0	0.30	172.10	686.0	-1.6	0.9	1.6	0.28	0.28	0.00	
814.0	0.30	186.90	814.0	-2.3	0.9	2.0	0.06	0.00	11.56	
942.0	0.00	145.20	942.0	-2.6	0.8	2.1	0.23	-0.23	0.00	
1,071.0	0.30	60.30	1,071.0	-2.5	1.1	2.3	0.23	0.23	0.00	
1,199.0	0.30	30.40	1,199.0	-2.0	1.6	2.4	0.12	0.00	-23.36	
1,327.0	0.30	306.90	1,327.0	-1.5	1.5	2.1	0.31	0.00	-65.23	
1,455.0	0.50	333.50	1,455.0	-0.8	1.0	1.3	0.21	0.16	20.78	
1,584.0	0.40	9.90	1,584.0	0.1	0.8	0.6	0.23	-0.08	28.22	
1,712.0	0.50	39.90	1,712.0	1.0	1.2	0.5	0.20	0.08	23.44	

Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Lorenz F23-31D
Project:	SEC.22-T5N-R65W (Grid North)	TVD Reference:	WELL @ 4638.0ft (Original Well Elev)
Site:	Lorenz Pad Sec.22-T5N-R65W	MD Reference:	WELL @ 4638.0ft (Original Well Elev)
Well:	Lorenz F23-31D	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)
1,840.0	1.80	129.60	1,840.0	0.1	3.1	2.6	1.46	1.02	70.08
1,968.0	4.10	128.30	1,967.8	-4.0	8.3	9.1	1.80	1.80	-1.02
2,097.0	5.20	123.10	2,096.4	-10.0	16.8	19.6	0.91	0.85	-4.03
2,225.0	5.20	131.20	2,223.8	-17.0	26.0	31.1	0.57	0.00	6.33
2,353.0	6.80	122.40	2,351.1	-24.9	36.8	44.4	1.44	1.25	-6.88
2,481.0	8.60	126.80	2,478.0	-34.7	50.9	61.5	1.48	1.41	3.44
2,610.0	10.90	126.20	2,605.1	-47.7	68.4	83.3	1.78	1.78	-0.47
2,738.0	11.50	126.10	2,730.7	-62.3	88.5	108.2	0.47	0.47	-0.08
2,866.0	10.90	124.30	2,856.2	-76.7	108.8	133.0	0.54	-0.47	-1.41
2,994.0	11.10	123.40	2,981.9	-90.3	129.1	157.4	0.21	0.16	-0.70
3,123.0	9.80	122.50	3,108.7	-103.0	148.7	180.8	1.02	-1.01	-0.70
3,251.0	11.00	119.20	3,234.6	-114.8	168.6	203.9	1.05	0.94	-2.58
3,379.0	11.20	117.80	3,360.2	-126.6	190.2	228.5	0.26	0.16	-1.09
3,507.0	10.10	114.60	3,486.0	-137.0	211.4	252.0	0.98	-0.86	-2.50
3,636.0	11.40	125.50	3,612.8	-149.2	232.1	275.9	1.87	1.01	8.45
3,764.0	11.60	126.60	3,738.2	-164.2	252.7	301.4	0.23	0.16	0.86
3,892.0	11.20	122.20	3,863.7	-178.5	273.6	326.6	0.75	-0.31	-3.44
4,020.0	11.00	122.50	3,989.3	-191.7	294.4	351.3	0.16	-0.16	0.23
4,149.0	10.70	122.90	4,116.0	-204.8	314.8	375.6	0.24	-0.23	0.31
4,277.0	10.10	122.00	4,241.9	-217.2	334.3	398.7	0.49	-0.47	-0.70
4,405.0	9.00	120.30	4,368.1	-228.2	352.5	419.9	0.89	-0.86	-1.33
4,533.0	7.90	115.00	4,494.7	-236.9	369.1	438.6	1.05	-0.86	-4.14
4,662.0	5.20	111.50	4,622.9	-242.8	382.6	453.1	2.11	-2.09	-2.71
4,790.0	3.20	110.40	4,750.5	-246.2	391.3	462.3	1.56	-1.56	-0.86
4,918.0	0.40	276.00	4,878.4	-247.4	394.2	465.4	2.80	-2.19	129.38
4,939.6	0.42	277.68	4,900.0	-247.4	394.1	465.2	0.09	0.07	7.76
TARGET BHL 1325'FNL & 75'FWL									
5,046.0	0.50	284.30	5,006.4	-247.2	393.2	464.4	0.09	0.08	6.22
5,175.0	0.50	249.60	5,135.4	-247.3	392.2	463.6	0.23	0.00	-26.90
5,303.0	0.50	271.10	5,263.4	-247.5	391.1	462.8	0.15	0.00	16.80
5,431.0	1.00	284.10	5,391.4	-247.2	389.4	461.2	0.41	0.39	10.16
5,559.0	1.20	266.20	5,519.4	-247.0	387.0	459.1	0.31	0.16	-13.98
5,688.0	0.60	200.10	5,648.4	-247.7	385.4	458.2	0.86	-0.47	-51.24
5,816.0	0.90	258.80	5,776.4	-248.5	384.2	457.6	0.61	0.23	45.86
5,944.0	2.10	287.60	5,904.3	-248.0	381.0	454.6	1.08	0.94	22.50
6,072.0	0.60	218.70	6,032.3	-247.8	378.4	452.3	1.54	-1.17	-53.83
6,201.0	0.90	168.60	6,161.3	-249.4	378.1	452.9	0.54	0.23	-38.84
6,329.0	1.10	162.80	6,289.3	-251.5	378.7	454.6	0.17	0.16	-4.53
6,457.0	0.90	154.20	6,417.2	-253.6	379.5	456.4	0.19	-0.16	-6.72
6,585.0	0.70	145.90	6,545.2	-255.2	380.4	458.0	0.18	-0.16	-6.48
6,687.8	0.62	141.97	6,648.0	-256.1	381.1	459.1	0.09	-0.08	-3.82
TARGET CIRCLE 1325'FNL & 75'FWL									
6,714.0	0.60	140.80	6,674.2	-256.3	381.2	459.3	0.09	-0.08	-4.46
6,842.0	0.60	145.90	6,802.2	-257.4	382.0	460.6	0.04	0.00	3.98
6,970.0	0.50	146.80	6,930.2	-258.4	382.7	461.7	0.08	-0.08	0.70
7,098.0	0.40	120.60	7,058.2	-259.1	383.4	462.7	0.18	-0.08	-20.47
7,145.0	0.30	108.80	7,105.2	-259.3	383.7	463.0	0.26	-0.21	-25.11
7,167.6	0.30	108.80	7,127.8	-259.3	383.8	463.1	0.00	0.00	0.00
HARDLINE 75'W OF BHL									
7,190.0	0.30	108.80	7,150.2	-259.3	383.9	463.2	0.00	0.00	0.00

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Design:	Wellbore #1	Database:	Landmark

Checked By: _____	Approved By: _____	Date: _____
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