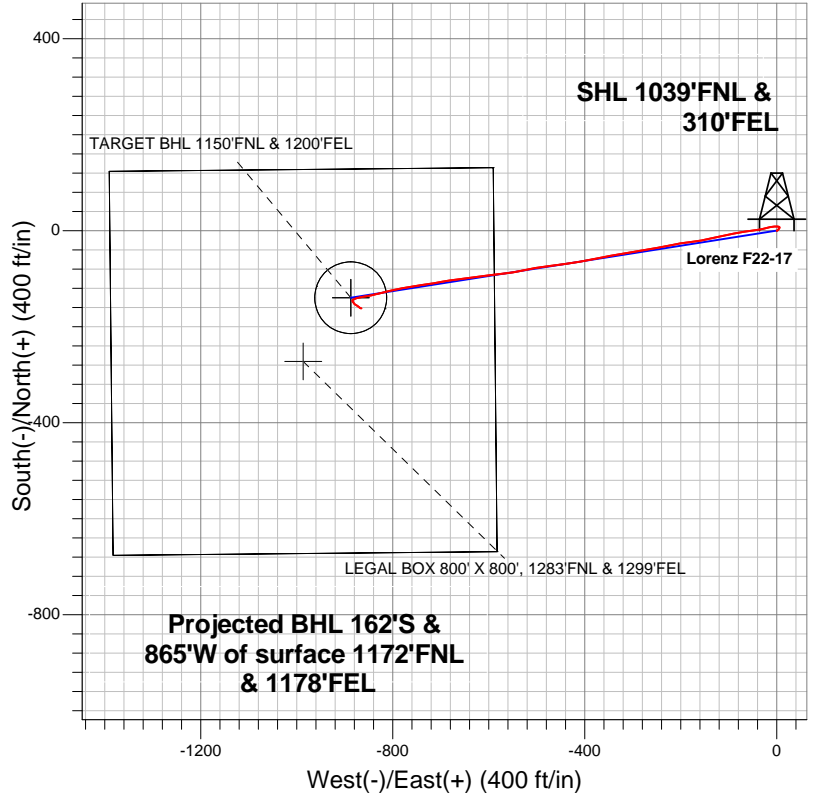


# Well Name: Lorenz F22-17




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	1385722.96	3239272.58	40.389030	-104.641010	
Original Well Elev		WELL @ 4638.0ft (Original Well Elev)				

## NOBLE ENERGY INC WELD COUNTY CO



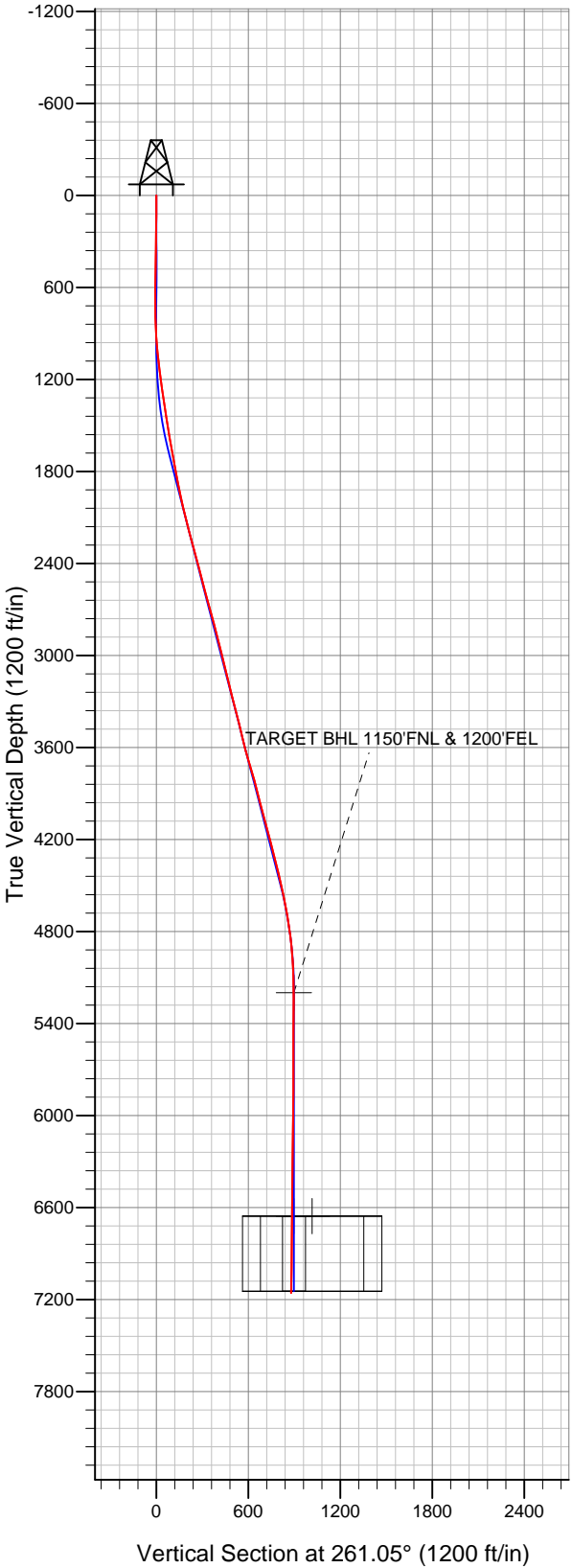
### LEGEND

-  Wellbore #1
-  Lorenz F22-17, Wellbore #1, Noble Lorenz F22-17 Plan #1 (7-30-12) R V0
-  Survey #1

## Final Survey Plot

Projected Final Survey -  
7260'MD & 7157'TVD @ 880'VS  
0.80 deg Inc 98.80 deg AZ

Project: SEC.22-T5N-R65W (Grid North)  
Site: Lorenz Pad Sec.22-T5N-R65W  
Well: Lorenz F22-17  
Plan: Wellbore #1





# **NOBLE ENERGY INC WELD COUNTY CO**

**SEC.22-T5N-R65W (Grid North)  
Lorenz Pad Sec.22-T5N-R65W  
Lorenz F22-17**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**07 August, 2012**



<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Lorenz F22-17
<b>Project:</b>	SEC.22-T5N-R65W (Grid North)	<b>TVD Reference:</b>	WELL @ 4638.0ft (Original Well Elev)
<b>Site:</b>	Lorenz Pad Sec.22-T5N-R65W	<b>MD Reference:</b>	WELL @ 4638.0ft (Original Well Elev)
<b>Well:</b>	Lorenz F22-17	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

<b>Project</b>	SEC.22-T5N-R65W (Grid North), Weld County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

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

<b>Well</b>	Lorenz F22-17		
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b>
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b>
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40.389030
		<b>Longitude:</b>	-104.641010
		<b>Ground Level:</b>	4,625.0 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	7/30/2012	8.65	67.02	53,022

<b>Design</b>	Wellbore #1				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	261.05	

<b>Survey Program</b>	<b>Date</b>	8/6/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
136.0	7,260.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard	

<b>Survey</b>										
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
136.0	0.30	145.00	136.0	-0.3	0.2	-0.2	0.22	0.22	0.00	
353.0	1.50	45.90	353.0	1.2	2.6	-2.7	0.73	0.55	-45.67	
480.0	1.20	38.30	479.9	3.4	4.6	-5.1	0.27	-0.24	-5.98	
578.0	0.90	27.40	577.9	4.9	5.6	-6.3	0.37	-0.31	-11.12	
686.0	1.10	355.30	685.9	6.7	5.9	-6.9	0.54	0.19	-29.72	
814.0	1.80	283.90	813.9	8.4	3.8	-5.1	1.39	0.55	-55.78	
942.0	4.20	269.10	941.7	8.8	-2.8	1.4	1.95	1.88	-11.56	
1,071.0	6.30	256.80	1,070.1	7.1	-14.4	13.1	1.84	1.63	-9.53	
1,199.0	7.50	257.30	1,197.2	3.7	-29.4	28.5	0.94	0.94	0.39	
1,327.0	9.00	262.30	1,323.9	0.5	-47.5	46.8	1.30	1.17	3.91	
1,455.0	8.50	261.60	1,450.4	-2.2	-66.8	66.3	0.40	-0.39	-0.55	
1,584.0	9.80	258.40	1,577.8	-5.8	-86.9	86.8	1.08	1.01	-2.48	

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Lorenz F22-17
<b>Project:</b>	SEC.22-T5N-R65W (Grid North)	<b>TVD Reference:</b>	WELL @ 4638.0ft (Original Well Elev)
<b>Site:</b>	Lorenz Pad Sec.22-T5N-R65W	<b>MD Reference:</b>	WELL @ 4638.0ft (Original Well Elev)
<b>Well:</b>	Lorenz F22-17	<b>North Reference:</b>	Grid
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	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)
1,712.0	10.20	259.60	1,703.8	-10.1	-108.8	109.0	0.35	0.31	0.94
1,840.0	10.80	255.80	1,829.7	-15.0	-131.5	132.3	0.72	0.47	-2.97
1,968.0	12.30	259.80	1,955.1	-20.4	-156.6	157.9	1.33	1.17	3.13
2,097.0	13.60	263.50	2,080.8	-24.6	-185.2	186.7	1.19	1.01	2.87
2,225.0	14.30	258.20	2,205.0	-29.5	-215.6	217.6	1.14	0.55	-4.14
2,353.0	15.70	260.00	2,328.7	-35.7	-248.1	250.7	1.15	1.09	1.41
2,481.0	15.00	260.70	2,452.1	-41.4	-281.5	284.6	0.57	-0.55	0.55
2,610.0	14.60	260.50	2,576.8	-46.8	-314.1	317.5	0.31	-0.31	-0.16
2,738.0	15.60	259.30	2,700.4	-52.7	-346.9	350.8	0.82	0.78	-0.94
2,866.0	14.20	258.10	2,824.1	-59.1	-379.2	383.7	1.12	-1.09	-0.94
2,994.0	14.50	261.20	2,948.1	-64.8	-410.4	415.4	0.64	0.23	2.42
3,123.0	13.60	261.60	3,073.2	-69.5	-441.3	446.7	0.70	-0.70	0.31
3,251.0	14.20	263.30	3,197.5	-73.5	-471.8	477.5	0.57	0.47	1.33
3,379.0	14.20	260.70	3,321.6	-77.9	-502.9	508.9	0.50	0.00	-2.03
3,507.0	13.70	257.20	3,445.8	-83.8	-533.2	539.7	0.77	-0.39	-2.73
3,636.0	14.20	263.70	3,571.0	-88.9	-563.8	570.7	1.27	0.39	5.04
3,764.0	16.50	263.10	3,694.4	-92.8	-597.4	604.6	1.80	1.80	-0.47
3,892.0	16.10	262.40	3,817.3	-97.3	-633.1	640.5	0.35	-0.31	-0.55
4,020.0	13.90	262.80	3,940.9	-101.6	-665.9	673.6	1.72	-1.72	0.31
4,149.0	14.90	259.60	4,065.9	-106.5	-697.6	705.7	0.99	0.78	-2.48
4,277.0	13.90	261.20	4,189.8	-111.8	-729.0	737.5	0.84	-0.78	1.25
4,405.0	14.40	261.20	4,314.0	-116.6	-759.9	768.8	0.39	0.39	0.00
4,533.0	14.30	258.40	4,438.0	-122.2	-791.1	800.5	0.55	-0.08	-2.19
4,662.0	11.70	255.40	4,563.6	-128.8	-819.4	829.5	2.08	-2.02	-2.33
4,790.0	9.60	258.10	4,689.4	-134.2	-842.4	853.0	1.69	-1.64	2.11
4,918.0	7.60	260.90	4,816.0	-137.8	-861.2	872.2	1.60	-1.56	2.19
5,046.0	4.90	253.30	4,943.2	-140.7	-874.8	886.0	2.20	-2.11	-5.94
5,175.0	2.30	232.70	5,072.0	-143.8	-882.1	893.8	2.22	-2.02	-15.97
5,303.0	0.60	165.90	5,199.9	-146.0	-884.0	896.0	1.67	-1.33	-52.18
<b>TARGET BHL 1150'FNL &amp; 1200'FEL</b>									
5,431.0	0.50	151.00	5,327.9	-147.2	-883.6	895.7	0.14	-0.08	-11.64
5,559.0	0.40	126.20	5,455.9	-147.9	-883.0	895.2	0.17	-0.08	-19.38
5,688.0	0.60	147.70	5,584.9	-148.8	-882.2	894.6	0.21	0.16	16.67
5,816.0	0.40	158.90	5,712.9	-149.7	-881.7	894.3	0.17	-0.16	8.75
5,944.0	0.70	145.00	5,840.9	-150.8	-881.1	893.8	0.25	0.23	-10.86
6,072.0	0.60	131.10	5,968.9	-151.9	-880.1	893.1	0.15	-0.08	-10.86
6,201.0	1.10	140.10	6,097.9	-153.3	-878.8	892.0	0.40	0.39	6.98
6,329.0	1.00	112.20	6,225.9	-154.6	-877.0	890.4	0.40	-0.08	-21.80
6,457.0	0.90	126.40	6,353.8	-155.7	-875.2	888.7	0.20	-0.08	11.09
6,585.0	1.30	124.10	6,481.8	-157.1	-873.2	887.0	0.31	0.31	-1.80
6,714.0	0.70	137.50	6,610.8	-158.5	-871.4	885.5	0.50	-0.47	10.39
6,758.9	0.72	129.85	6,655.7	-158.9	-871.0	885.1	0.22	0.05	-17.04
<b>LEGAL BOX 800' X 800', 1283'FNL &amp; 1299'FEL - TARGET CIRCLE 1150'FNL &amp; 1200'FEL</b>									
6,842.0	0.80	117.40	6,738.8	-159.5	-870.1	884.3	0.22	0.09	-14.98
6,970.0	0.80	131.80	6,866.8	-160.5	-868.6	883.0	0.16	0.00	11.25
7,098.0	0.70	112.70	6,994.8	-161.4	-867.3	881.8	0.21	-0.08	-14.92
7,215.0	0.80	98.80	7,111.7	-161.8	-865.8	880.4	0.18	0.09	-11.88
7,260.0	0.80	98.80	7,156.7	-161.9	-865.2	879.8	0.00	0.00	0.00

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Lorenz F22-17
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<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Wellbore #1	<b>Database:</b>	Landmark

Checked By: _____	Approved By: _____	Date: _____
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