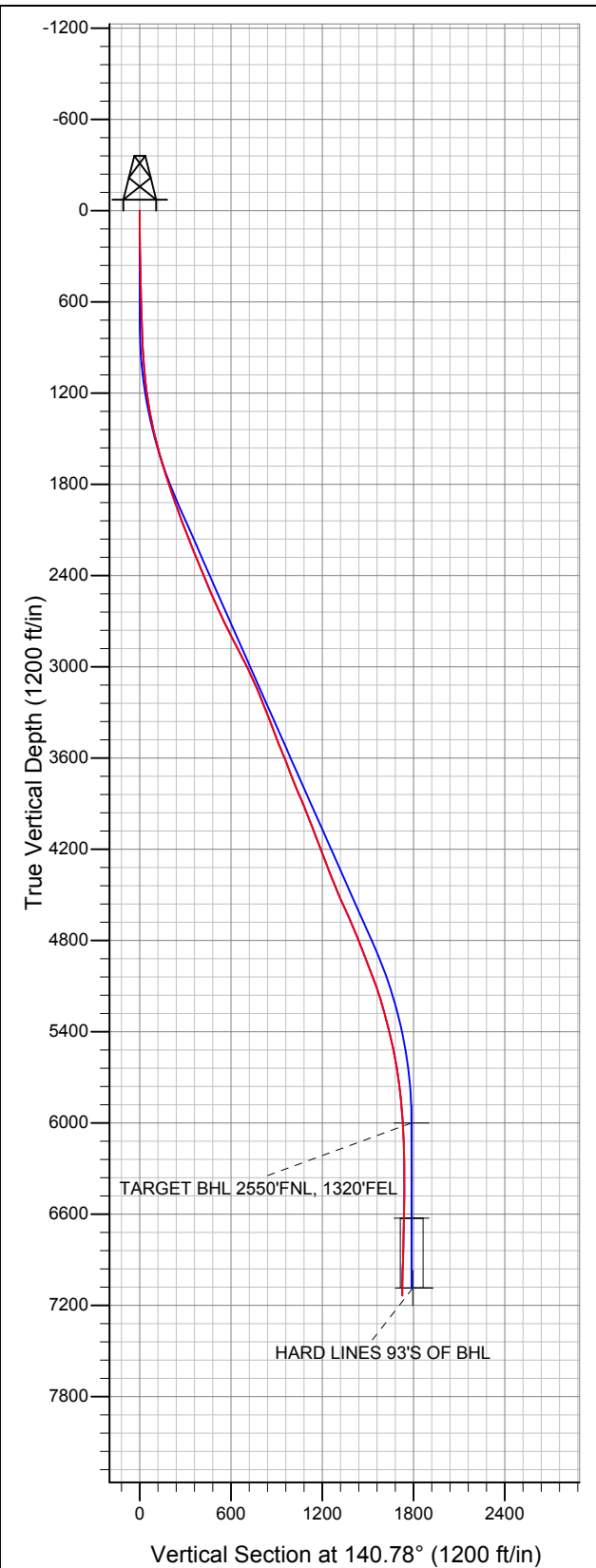


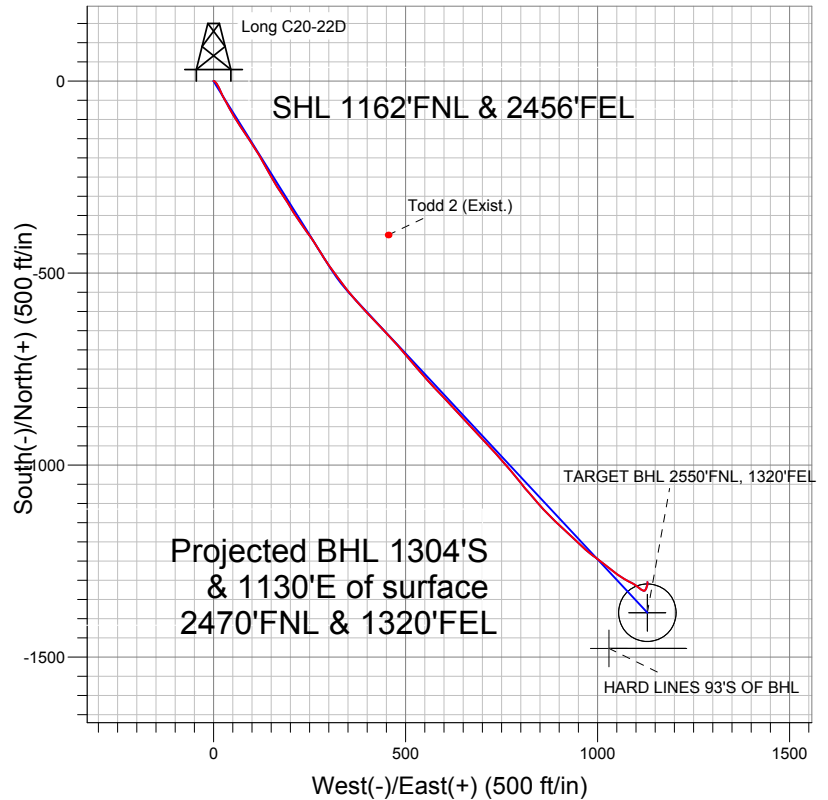


# Well Name: Long C20-22D

Surface Location: Long C20-18 Pad Sec.20-T4N-R64W  
North American Datum 1983 US State Plane 1983 Colorado Northern Zone  
Ground Elevation: 4733.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1354200.96 3258277.15 40.301980 -104.573970  
Original Well Elev WELL @ 4746.0ft (Original Well Elev)



## NOBLE ENERGY INC WELD COUNTY CO



### LEGEND

- Survey #1
- Long C20-22D, Wellbore #1, Noble Long C20-22D Plan #1 (7-06-11) V0
- Wellbore #1

## Final Survey Plot

Projected Final Survey -  
7452'MD & 7136'TVD @ 1705'VS  
0.9 deg Inc 339.0 deg AZ

Project: SEC.20-T4N-R64W  
Site: Long C20-18 Pad Sec.20-T4N-R64W  
Well: Long C20-22D  
Plan: Wellbore #1



# **NOBLE ENERGY INC WELD COUNTY CO**

**SEC.20-T4N-R64W**

**Long C20-18 Pad Sec.20-T4N-R64W**

**Long C20-22D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**12 December, 2011**



<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Long C20-22D
<b>Project:</b>	SEC.20-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4746.0ft (Original Well Elev)
<b>Site:</b>	Long C20-18 Pad Sec.20-T4N-R64W	<b>MD Reference:</b>	WELL @ 4746.0ft (Original Well Elev)
<b>Well:</b>	Long C20-22D	<b>North Reference:</b>	True
<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.20-T4N-R64W, 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>	Long C20-18 Pad Sec.20-T4N-R64W		
<b>Site Position:</b>		<b>Northing:</b>	1,354,233.47 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,258,248.92 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40.302070
		<b>Longitude:</b>	-104.574070
		<b>Grid Convergence:</b>	0.60 °

<b>Well</b>	Long C20-22D		
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b> 1,354,200.96 ft
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b> 3,258,277.15 ft
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40.301980
		<b>Longitude:</b>	-104.573970
		<b>Ground Level:</b>	4,733.0 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	7/6/2011	8.75	67.00	53,095

<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	140.78	

<b>Survey Program</b>	<b>Date</b>	12/12/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
138.0	7,452.0	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	
138.0	0.40	92.00	138.0	0.0	0.5	0.3	0.29	0.29	0.00	
233.0	0.80	98.90	233.0	-0.1	1.5	1.0	0.43	0.42	7.26	
328.0	1.50	135.40	328.0	-1.1	3.0	2.8	1.03	0.74	38.42	
423.0	1.30	136.70	422.9	-2.8	4.6	5.1	0.21	-0.21	1.37	
518.0	1.30	134.30	517.9	-4.3	6.1	7.2	0.06	0.00	-2.53	
613.0	1.50	143.30	612.9	-6.1	7.6	9.5	0.31	0.21	9.47	
708.0	1.20	147.40	707.9	-7.9	8.9	11.8	0.33	-0.32	4.32	
768.0	1.80	145.00	767.8	-9.2	9.8	13.3	1.01	1.00	-4.00	
850.0	2.80	150.00	849.8	-12.0	11.5	16.6	1.24	1.22	6.10	
931.0	3.40	156.80	930.7	-15.9	13.5	20.9	0.87	0.74	8.40	
1,013.0	4.60	156.20	1,012.5	-21.2	15.8	26.4	1.46	1.46	-0.73	
1,095.0	5.90	153.90	1,094.1	-28.0	18.9	33.6	1.61	1.59	-2.80	

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Long C20-22D
<b>Project:</b>	SEC.20-T4N-R64W	<b>TVD Reference:</b>	WELL @ 4746.0ft (Original Well Elev)
<b>Site:</b>	Long C20-18 Pad Sec.20-T4N-R64W	<b>MD Reference:</b>	WELL @ 4746.0ft (Original Well Elev)
<b>Well:</b>	Long C20-22D	<b>North Reference:</b>	True
<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)
1,176.0	7.00	153.50	1,174.6	-36.1	23.0	42.5	1.36	1.36	-0.49
1,258.0	9.30	152.60	1,255.8	-46.5	28.2	53.9	2.81	2.80	-1.10
1,340.0	10.90	151.00	1,336.5	-59.1	35.1	68.0	1.98	1.95	-1.95
1,422.0	12.30	151.40	1,416.8	-73.6	43.0	84.2	1.71	1.71	0.49
1,504.0	14.30	149.90	1,496.6	-90.0	52.3	102.8	2.47	2.44	-1.83
1,585.0	14.90	146.40	1,575.0	-107.3	63.0	123.0	1.32	0.74	-4.32
1,667.0	16.20	146.70	1,654.0	-125.7	75.2	144.9	1.59	1.59	0.37
1,749.0	17.80	145.90	1,732.4	-145.6	88.5	168.8	1.97	1.95	-0.98
1,831.0	18.60	147.30	1,810.3	-167.0	102.5	194.2	1.11	0.98	1.71
1,913.0	19.60	149.10	1,887.8	-189.8	116.7	220.8	1.42	1.22	2.20
1,994.0	19.60	151.20	1,964.1	-213.4	130.2	247.6	0.87	0.00	2.59
2,076.0	20.40	150.40	2,041.2	-237.9	143.9	275.3	1.03	0.98	-0.98
2,158.0	21.70	149.60	2,117.7	-263.4	158.6	304.3	1.62	1.59	-0.98
2,240.0	22.60	146.20	2,193.6	-289.5	175.1	335.0	1.91	1.10	-4.15
2,321.0	22.50	148.10	2,268.4	-315.6	191.9	365.9	0.91	-0.12	2.35
2,403.0	22.50	147.80	2,344.2	-342.2	208.6	397.0	0.14	0.00	-0.37
2,485.0	22.70	145.30	2,419.9	-368.5	225.9	428.3	1.20	0.24	-3.05
2,566.0	23.00	143.30	2,494.5	-394.0	244.3	459.7	1.03	0.37	-2.47
2,648.0	23.50	147.40	2,569.9	-420.7	262.7	492.0	2.07	0.61	5.00
2,730.0	24.70	148.70	2,644.7	-449.1	280.4	525.2	1.60	1.46	1.59
2,812.0	26.40	145.20	2,718.7	-478.7	299.7	560.3	2.77	2.07	-4.27
2,894.0	26.90	143.30	2,792.0	-508.5	321.2	597.1	1.20	0.61	-2.32
2,975.0	27.90	142.00	2,863.9	-538.2	343.8	634.3	1.44	1.23	-1.60
3,057.0	26.90	139.40	2,936.7	-567.4	367.7	672.0	1.90	-1.22	-3.17
3,139.0	25.60	138.20	3,010.3	-594.7	391.6	708.3	1.71	-1.59	-1.46
3,221.0	25.10	134.70	3,084.4	-620.1	415.7	743.3	1.93	-0.61	-4.27
3,303.0	23.60	137.30	3,159.1	-644.4	439.2	777.0	2.25	-1.83	3.17
3,384.0	22.20	137.00	3,233.7	-667.5	460.7	808.4	1.73	-1.73	-0.37
3,466.0	20.00	139.40	3,310.2	-689.5	480.3	837.9	2.88	-2.68	2.93
3,548.0	20.40	139.30	3,387.2	-711.0	498.8	866.2	0.49	0.49	-0.12
3,630.0	21.40	139.40	3,463.8	-733.2	517.8	895.4	1.22	1.22	0.12
3,712.0	23.10	139.50	3,539.7	-756.8	538.0	926.5	2.07	2.07	0.12
3,793.0	21.30	137.90	3,614.6	-779.8	558.2	957.1	2.34	-2.22	-1.98
3,875.0	20.90	136.60	3,691.1	-801.4	578.3	986.5	0.75	-0.49	-1.59
3,957.0	21.60	137.20	3,767.6	-823.1	598.6	1,016.2	0.89	0.85	0.73
4,039.0	22.70	137.10	3,843.5	-845.8	619.6	1,047.0	1.34	1.34	-0.12
4,120.0	22.90	137.20	3,918.2	-868.8	640.9	1,078.4	0.25	0.25	0.12
4,202.0	22.30	136.90	3,993.9	-891.9	662.4	1,109.8	0.75	-0.73	-0.37
4,284.0	21.20	136.40	4,070.1	-914.0	683.3	1,140.1	1.36	-1.34	-0.61
4,366.0	21.60	136.50	4,146.4	-935.7	703.9	1,169.9	0.49	0.49	0.12
4,447.0	19.90	137.00	4,222.1	-956.6	723.5	1,198.6	2.11	-2.10	0.62
4,529.0	20.00	140.00	4,299.2	-977.5	742.1	1,226.5	1.25	0.12	3.66
4,611.0	22.20	140.50	4,375.7	-1,000.2	760.9	1,256.0	2.69	2.68	0.61
4,693.0	22.60	139.30	4,451.5	-1,024.1	781.1	1,287.3	0.74	0.49	-1.46
4,775.0	22.90	140.60	4,527.2	-1,048.4	801.5	1,319.0	0.71	0.37	1.59
4,856.0	24.80	139.40	4,601.2	-1,073.5	822.5	1,351.7	2.42	2.35	-1.48
4,938.0	24.00	138.50	4,675.9	-1,099.0	844.8	1,385.6	1.08	-0.98	-1.10
5,020.0	23.20	136.80	4,751.1	-1,123.3	866.9	1,418.4	1.28	-0.98	-2.07
5,102.0	21.70	133.20	4,826.8	-1,145.4	889.0	1,449.5	2.48	-1.83	-4.39
5,183.0	20.10	134.10	4,902.5	-1,165.4	909.9	1,478.2	2.01	-1.98	1.11
5,265.0	21.80	131.30	4,979.1	-1,185.2	931.5	1,507.2	2.41	2.07	-3.41
5,347.0	21.40	134.00	5,055.3	-1,205.7	953.7	1,537.1	1.31	-0.49	3.29
5,429.0	18.40	131.30	5,132.4	-1,224.6	974.1	1,564.7	3.83	-3.66	-3.29
5,511.0	17.20	124.10	5,210.5	-1,239.9	993.9	1,589.1	3.05	-1.46	-8.78

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Long C20-22D
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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

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)
5,592.0	15.80	129.60	5,288.2	-1,253.7	1,012.3	1,611.4	2.59	-1.73	6.79
5,674.0	14.30	129.70	5,367.4	-1,267.3	1,028.7	1,632.2	1.83	-1.83	0.12
5,756.0	13.20	125.60	5,447.0	-1,279.2	1,044.1	1,651.2	1.79	-1.34	-5.00
5,837.0	12.60	124.40	5,526.0	-1,289.6	1,058.9	1,668.6	0.81	-0.74	-1.48
5,919.0	11.00	118.00	5,606.2	-1,298.3	1,073.2	1,684.4	2.52	-1.95	-7.80
6,001.0	8.30	118.40	5,687.1	-1,304.8	1,085.3	1,697.1	3.29	-3.29	0.49
6,083.0	7.20	121.40	5,768.3	-1,310.3	1,094.9	1,707.4	1.43	-1.34	3.66
6,165.0	6.30	129.30	5,849.8	-1,315.8	1,102.8	1,716.7	1.57	-1.10	9.63
6,246.0	4.70	126.70	5,930.4	-1,320.6	1,108.9	1,724.3	2.00	-1.98	-3.21
6,319.2	3.36	124.49	6,003.4	-1,323.6	1,113.1	1,729.2	1.84	-1.83	-3.02
<b>TARGET BHL 2550'FNL, 1320'FEL</b>									
6,328.0	3.20	124.10	6,012.2	-1,323.9	1,113.5	1,729.7	1.84	-1.82	-4.43
6,410.0	2.40	118.60	6,094.1	-1,326.0	1,116.9	1,733.5	1.03	-0.98	-6.71
6,491.0	1.50	110.40	6,175.0	-1,327.2	1,119.4	1,736.0	1.16	-1.11	-10.12
6,573.0	1.00	93.70	6,257.0	-1,327.6	1,121.1	1,737.4	0.75	-0.61	-20.37
6,737.0	1.00	36.00	6,421.0	-1,326.5	1,123.4	1,738.0	0.59	0.00	-35.18
6,900.0	1.10	26.90	6,584.0	-1,324.0	1,124.9	1,737.0	0.12	0.06	-5.58
6,940.5	1.37	26.70	6,624.5	-1,323.2	1,125.3	1,736.6	0.67	0.67	-0.49
<b>TARGET CIRCLE 2550'FNL &amp; 1320'FEL</b>									
7,064.0	2.20	26.40	6,747.9	-1,319.8	1,127.0	1,735.1	0.67	0.67	-0.24
7,227.0	3.60	11.40	6,910.7	-1,311.9	1,129.4	1,730.5	0.97	0.86	-9.20
7,395.6	1.03	345.26	7,079.1	-1,305.3	1,130.1	1,725.8	1.61	-1.52	-15.51
<b>HARD LINES 93'S OF BHL</b>									
7,406.0	0.90	339.00	7,089.5	-1,305.1	1,130.0	1,725.6	1.61	-1.25	-60.00
7,452.0	0.90	339.00	7,135.5	-1,304.4	1,129.8	1,724.9	0.00	0.00	0.00

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_