

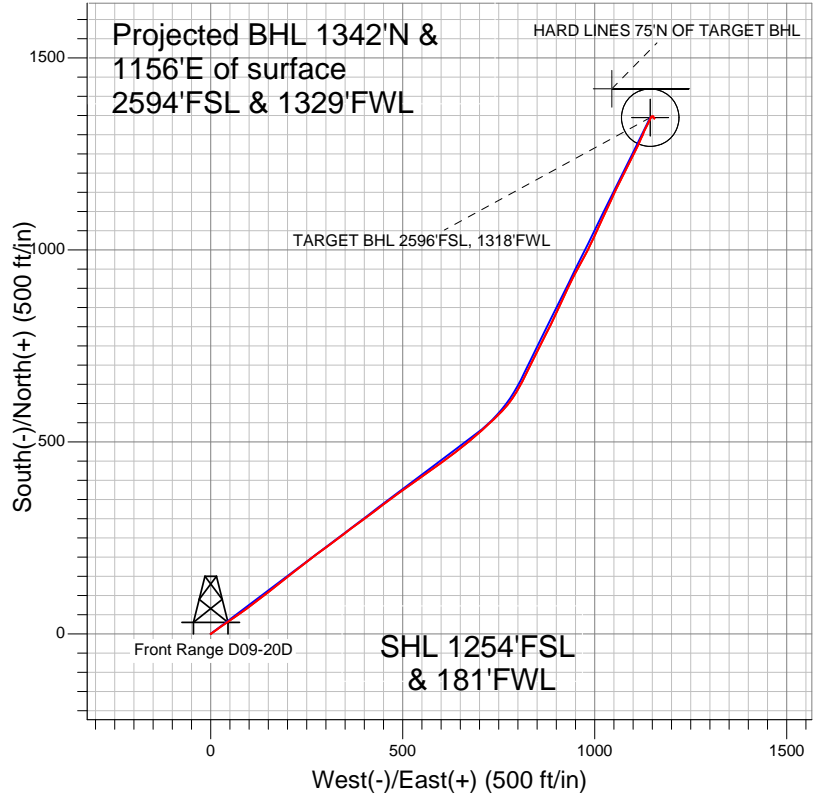
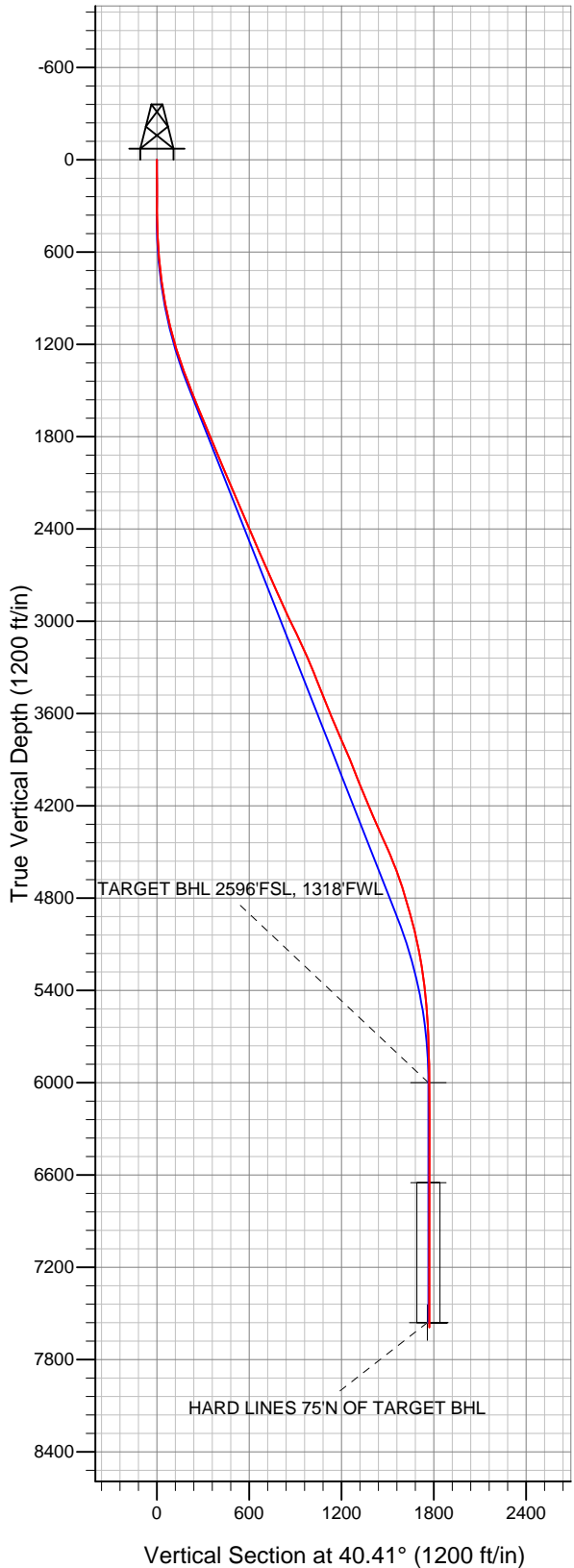


# Well Name: Front Range D09-20D

Surface Location: Front Range D09-25D Pad Sec.9-T3N-R64W  
 North American Datum 1983 US State Plane 1983Colorado Northern Zone  
 Ground Elevation: 4737.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1330236.94	3261065.33	40.236120	-104.564880	
Original Well Elev			WELL @ 4750.0ft (Original Well Elev)			

## NOBLE ENERGY INC WELD COUNTY CO



- LEGEND
- Wellbore #1
  - Front Range D09-20D, Wellbore #1, Noble Front Range D09-20D Plan #1 (5-21-12) R V0
  - Survey #1

## Final Survey Plot

Projected Final Survey -  
 7934'MD & 7590'TVD @ 1771'VS  
 0.40 deg Inc 158.00 deg AZ

Project: SEC.9-T3N-R64W  
 Site: Front Range D09-25D Pad Sec.9-T3N-R64W  
 Well: Front Range D09-20D  
 Plan: Wellbore #1



# **NOBLE ENERGY INC WELD COUNTY CO**

**SEC.9-T3N-R64W**

**Front Range D09-25D Pad Sec.9-T3N-R64W**

**Front Range D09-20D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**29 May, 2012**



<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Front Range D09-20D
<b>Project:</b>	SEC.9-T3N-R64W	<b>TVD Reference:</b>	WELL @ 4750.0ft (Original Well Elev)
<b>Site:</b>	Front Range D09-25D Pad Sec.9-T3N-R64W	<b>MD Reference:</b>	WELL @ 4750.0ft (Original Well Elev)
<b>Well:</b>	Front Range D09-20D	<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.9-T3N-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>	Front Range D09-25D Pad Sec.9-T3N-R64W		
<b>Site Position:</b>		<b>Northing:</b>	1,330,215.10ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,261,065.56ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40.236060
		<b>Longitude:</b>	-104.564880
		<b>Grid Convergence:</b>	0.60 °

<b>Well</b>	Front Range D09-20D		
<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>	40.236120
		<b>Longitude:</b>	-104.564880
		<b>Ground Level:</b>	4,737.0 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	5/21/2012	8.62	66.92	52,969

<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>	
	6,000.0	0.0	0.0	40.41	

<b>Survey Program</b>	<b>Date</b>	5/29/2012			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
74.0	7,934.0	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	
74.0	0.40	47.10	74.0	0.2	0.2	0.3	0.54	0.54	0.00	
165.0	0.40	53.40	165.0	0.6	0.7	0.9	0.05	0.00	6.92	
253.0	0.30	66.50	253.0	0.9	1.1	1.4	0.14	-0.11	14.89	
355.0	0.50	73.00	355.0	1.1	1.8	2.0	0.20	0.20	6.37	
483.0	2.30	53.40	482.9	2.8	4.4	5.0	1.43	1.41	-15.31	
611.0	4.60	54.90	610.7	7.3	10.7	12.4	1.80	1.80	1.17	
710.0	6.40	53.40	709.2	12.8	18.3	21.7	1.82	1.82	-1.52	
769.0	7.10	54.30	767.8	16.9	23.9	28.4	1.20	1.19	1.53	
897.0	10.30	56.40	894.4	27.9	39.9	47.1	2.51	2.50	1.64	
1,025.0	12.80	54.10	1,019.8	42.5	60.9	71.9	1.99	1.95	-1.80	
1,154.0	15.70	54.10	1,144.8	61.2	86.6	102.7	2.25	2.25	0.00	
1,282.0	18.40	54.00	1,267.1	83.2	117.0	139.2	2.11	2.11	-0.08	

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Front Range D09-20D
<b>Project:</b>	SEC.9-T3N-R64W	<b>TVD Reference:</b>	WELL @ 4750.0ft (Original Well Elev)
<b>Site:</b>	Front Range D09-25D Pad Sec.9-T3N-R64W	<b>MD Reference:</b>	WELL @ 4750.0ft (Original Well Elev)
<b>Well:</b>	Front Range D09-20D	<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)
1,411.0	20.60	51.00	1,388.7	109.4	151.1	181.3	1.87	1.71	-2.33
1,539.0	22.20	51.90	1,507.9	138.5	187.7	227.1	1.28	1.25	0.70
1,667.0	22.60	51.70	1,626.2	168.7	226.0	275.0	0.32	0.31	-0.16
1,796.0	23.20	53.40	1,745.1	199.2	265.8	324.0	0.69	0.47	1.32
1,924.0	23.00	53.80	1,862.8	229.0	306.3	372.9	0.20	-0.16	0.31
2,053.0	23.00	52.20	1,981.6	259.3	346.5	422.1	0.48	0.00	-1.24
2,181.0	24.70	53.30	2,098.6	290.7	387.7	472.7	1.37	1.33	0.86
2,309.0	23.00	54.00	2,215.7	321.3	429.4	523.0	1.35	-1.33	0.55
2,438.0	23.40	52.90	2,334.3	351.6	470.2	572.5	0.46	0.31	-0.85
2,566.0	24.00	53.80	2,451.5	382.3	511.5	622.7	0.55	0.47	0.70
2,695.0	24.50	54.70	2,569.1	413.3	554.5	674.1	0.48	0.39	0.70
2,823.0	24.60	54.50	2,685.5	444.1	597.9	725.7	0.10	0.08	-0.16
2,951.0	24.30	52.70	2,802.0	475.5	640.5	777.3	0.63	-0.23	-1.41
3,080.0	25.10	49.40	2,919.2	509.4	682.4	830.2	1.24	0.62	-2.56
3,208.0	26.30	47.60	3,034.6	546.2	723.9	885.2	1.12	0.94	-1.41
3,337.0	25.10	42.40	3,150.8	585.7	763.5	940.9	1.98	-0.93	-4.03
3,465.0	22.60	30.60	3,268.0	626.9	794.3	992.3	4.20	-1.95	-9.22
3,593.0	22.70	27.30	3,386.1	670.0	818.2	1,040.6	1.00	0.08	-2.58
3,722.0	22.80	25.30	3,505.0	714.7	840.3	1,089.0	0.60	0.08	-1.55
3,850.0	22.70	27.40	3,623.1	759.1	862.3	1,137.0	0.64	-0.08	1.64
3,979.0	24.30	26.00	3,741.4	805.1	885.4	1,186.9	1.31	1.24	-1.09
4,107.0	24.40	24.60	3,858.0	852.8	907.9	1,237.9	0.46	0.08	-1.09
4,235.0	21.50	25.30	3,975.9	898.0	928.9	1,286.0	2.28	-2.27	0.55
4,364.0	23.20	28.30	4,095.2	941.8	951.1	1,333.6	1.59	1.32	2.33
4,492.0	22.90	28.00	4,213.0	986.0	974.7	1,382.6	0.25	-0.23	-0.23
4,621.0	24.80	24.80	4,330.9	1,032.7	997.9	1,433.2	1.78	1.47	-2.48
4,749.0	25.30	25.10	4,446.9	1,081.8	1,020.7	1,485.4	0.40	0.39	0.23
4,877.0	22.40	24.30	4,564.0	1,128.8	1,042.4	1,535.2	2.28	-2.27	-0.63
5,006.0	19.80	26.20	4,684.3	1,170.8	1,062.1	1,580.0	2.08	-2.02	1.47
5,134.0	16.80	27.60	4,805.8	1,206.7	1,080.3	1,619.1	2.37	-2.34	1.09
5,263.0	15.70	25.80	4,929.7	1,238.9	1,096.5	1,654.2	0.94	-0.85	-1.40
5,391.0	13.00	26.90	5,053.6	1,267.4	1,110.6	1,684.9	2.12	-2.11	0.86
5,519.0	10.80	21.30	5,178.9	1,291.4	1,121.4	1,710.3	1.94	-1.72	-4.38
5,648.0	8.40	25.10	5,306.1	1,311.2	1,129.8	1,730.8	1.92	-1.86	2.95
5,776.0	6.00	29.00	5,433.1	1,325.5	1,137.0	1,746.4	1.91	-1.88	3.05
5,905.0	3.90	25.00	5,561.6	1,335.4	1,142.2	1,757.2	1.65	-1.63	-3.10
6,033.0	2.30	23.70	5,689.4	1,341.7	1,145.0	1,763.9	1.25	-1.25	-1.02
6,161.0	1.80	27.80	5,817.3	1,345.8	1,147.0	1,768.3	0.41	-0.39	3.20
6,290.0	0.40	103.90	5,946.3	1,347.5	1,148.4	1,770.5	1.35	-1.09	58.99
6,343.7	0.46	85.57	6,000.0	1,347.5	1,148.8	1,770.7	0.28	0.11	-34.14
<b>TARGET BHL 2596'FSL, 1318'FWL</b>									
6,418.0	0.60	68.70	6,074.3	1,347.6	1,149.4	1,771.2	0.28	0.19	-22.70
6,547.0	0.50	79.10	6,203.3	1,348.0	1,150.6	1,772.3	0.11	-0.08	8.06
6,675.0	0.30	94.80	6,331.3	1,348.0	1,151.5	1,772.9	0.18	-0.16	12.27
6,803.0	0.30	123.60	6,459.3	1,347.8	1,152.1	1,773.1	0.12	0.00	22.50
6,932.0	0.30	157.00	6,588.3	1,347.3	1,152.5	1,773.0	0.13	0.00	25.89
6,993.8	0.37	185.95	6,650.0	1,347.0	1,152.6	1,772.8	0.29	0.11	46.87
<b>TARGET CIRCLE 2596'FSL &amp; 1318'FWL</b>									
7,060.0	0.50	204.10	6,716.3	1,346.5	1,152.4	1,772.3	0.29	0.20	27.40
7,189.0	0.40	148.70	6,845.3	1,345.6	1,152.4	1,771.7	0.33	-0.08	-42.95
7,317.0	0.40	119.40	6,973.2	1,345.0	1,153.1	1,771.6	0.16	0.00	-22.89
7,445.0	0.40	141.50	7,101.2	1,344.5	1,153.7	1,771.6	0.12	0.00	17.27
7,574.0	0.40	131.10	7,230.2	1,343.8	1,154.4	1,771.5	0.06	0.00	-8.06
7,702.0	0.30	147.70	7,358.2	1,343.2	1,154.9	1,771.4	0.11	-0.08	12.97

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Front Range D09-20D
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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)	
7,831.0	0.40	154.90	7,487.2	1,342.5	1,155.2	1,771.1	0.08	0.08	5.58	
7,887.0	0.40	158.00	7,543.2	1,342.2	1,155.4	1,771.0	0.04	0.00	5.54	
HARD LINES 75°N OF TARGET BHL										
7,934.0	0.40	158.00	7,590.2	1,341.9	1,155.5	1,770.8	0.00	0.00	0.00	

Checked By: _____	Approved By: _____	Date: _____
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