

Well Name: **Betz PC G09-31D**

Surface Location: Betz PC G09-31D Pad Sec.9-T4N-R65W  
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

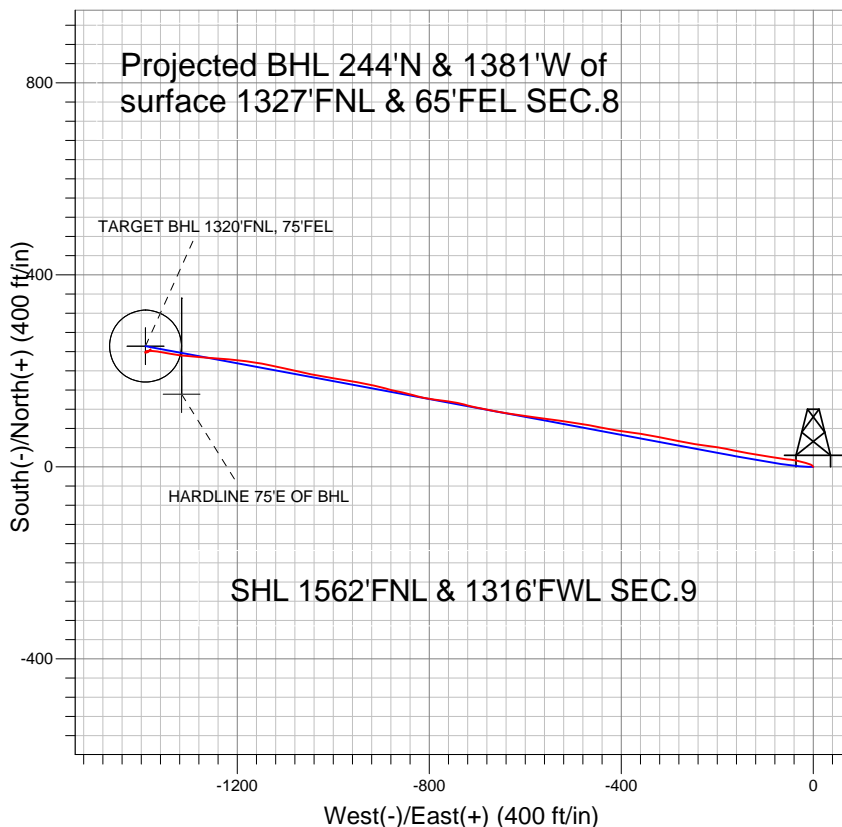
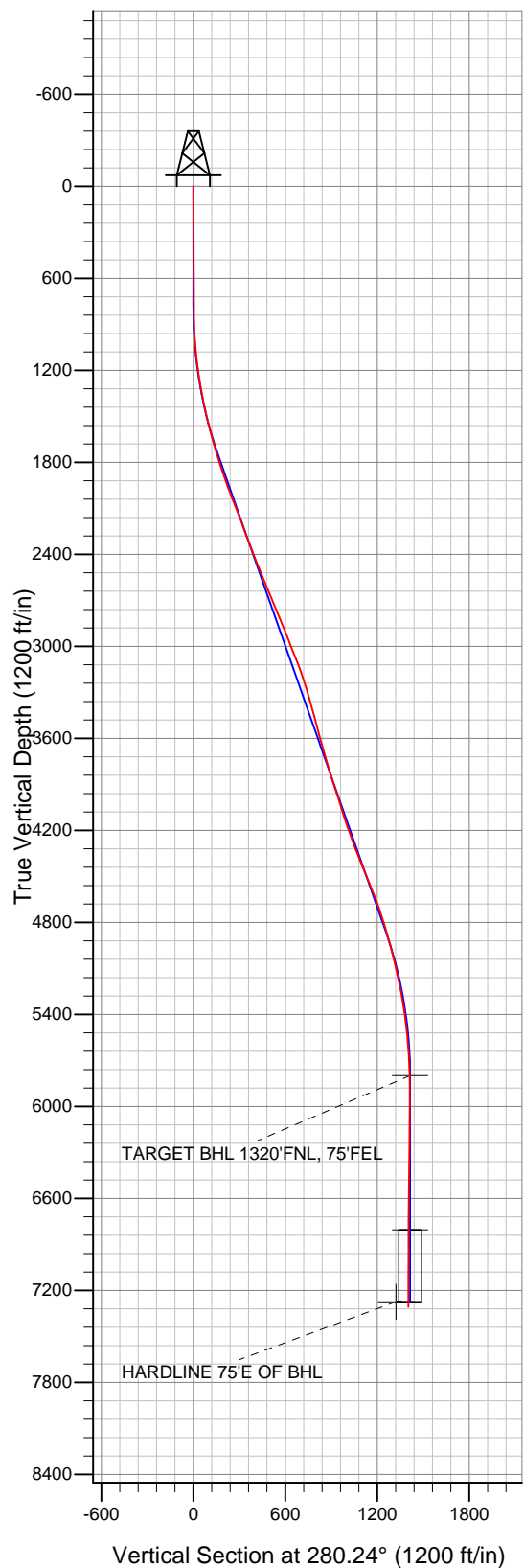
Ground Elevation: 4712.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1364160.77	3230598.55	40° 19' 48.252 N	104° 40' 22.332 W

Original Well Elev WELL @ 4725.0ft (Original Well Elev)

Slot

## NOBLE ENERGY INC WELD COUNTY CO



### LEGEND

- Betz PC G09-31D, Wellbore #1, Noble Betz PC G09-31D Plan #1 (8-10-10) VO
- Survey #1

## Final Survey Plot

Projected Final Survey -  
7533'MD & 7308'TVD @ 1402' VS  
0.3 deg Inc 37.6 deg AZ

Project: SEC.9-T4N-R65W  
Site: Betz PC G09-31D Pad Sec.9-T4N-R65W  
Well: Betz PC G09-31D  
Plan: Wellbore #1



## **Directional**

# **NOBLE ENERGY INC WELD COUNTY CO**

**SEC.9-T4N-R65W**

**Betz PC G09-31D Pad Sec.9-T4N-R65W**

**Betz PC G09-31D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**27 January, 2011**



<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Betz PC G09-31D
<b>Project:</b>	SEC.9-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4725.0ft (Original Well Elev)
<b>Site:</b>	Betz PC G09-31D Pad Sec.9-T4N-R65W	<b>MD Reference:</b>	WELL @ 4725.0ft (Original Well Elev)
<b>Well:</b>	Betz PC G09-31D	<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-T4N-R65W, 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>	Betz PC G09-31D Pad Sec.9-T4N-R65W		
<b>Site Position:</b>		<b>Northing:</b>	1,364,160.78 ft
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,230,598.55 ft
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"
		<b>Latitude:</b>	40° 19' 48.252 N
		<b>Longitude:</b>	104° 40' 22.332 W
		<b>Grid Convergence:</b>	0.53 °

<b>Well</b>	Betz PC G09-31D		
<b>Well Position</b>	<b>+N/-S</b>	0.0 ft	<b>Northing:</b> 1,364,160.77 ft
	<b>+E/-W</b>	0.0 ft	<b>Easting:</b> 3,230,598.55 ft
<b>Position Uncertainty</b>	0.0 ft	<b>Wellhead Elevation:</b>	ft
		<b>Latitude:</b>	40° 19' 48.252 N
		<b>Longitude:</b>	104° 40' 22.332 W
		<b>Ground Level:</b>	4,712.0 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	1/17/2011	8.86	67.02	53,149

<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>	
	5,800.0	0.0	0.0	280.24	

Date					
From ( )	To ( )	Survey (Wellbore)	Tool Name	Description	
		( )			

<b>Survey</b>										
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	
814.0	0.50	314.70	814.0	2.5	-2.5	2.9	0.06	0.06	0.00	
899.0	2.00	310.30	899.0	3.7	-3.9	4.5	1.77	1.76	-5.18	
985.0	3.30	288.40	984.9	5.5	-7.4	8.3	1.89	1.51	-25.47	
1,070.0	5.60	286.20	1,069.6	7.4	-13.7	14.8	2.71	2.71	-2.59	
1,156.0	7.00	286.10	1,155.1	10.0	-22.8	24.2	1.63	1.63	-0.12	
1,241.0	8.70	281.40	1,239.3	12.7	-34.1	35.8	2.14	2.00	-5.53	
1,327.0	10.20	275.50	1,324.1	14.7	-48.0	49.9	2.07	1.74	-6.86	
1,412.0	12.20	279.50	1,407.5	17.0	-64.4	66.4	2.52	2.35	4.71	
1,498.0	12.70	276.90	1,491.5	19.6	-82.7	84.9	0.87	0.58	-3.02	
1,583.0	14.20	280.20	1,574.1	22.6	-102.3	104.6	1.98	1.76	3.88	
1,669.0	15.90	279.60	1,657.2	26.4	-124.3	127.0	1.99	1.98	-0.70	
1,754.0	16.50	279.80	1,738.8	30.4	-147.6	150.7	0.71	0.71	0.24	

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Betz PC G09-31D
<b>Project:</b>	SEC.9-T4N-R65W	<b>TVD Reference:</b>	WELL @ 4725.0ft (Original Well Elev)
<b>Site:</b>	Betz PC G09-31D Pad Sec.9-T4N-R65W	<b>MD Reference:</b>	WELL @ 4725.0ft (Original Well Elev)
<b>Well:</b>	Betz PC G09-31D	<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)
1,840.0	17.80	282.70	1,821.0	35.4	-172.5	176.0	1.81	1.51	3.37
1,925.0	19.80	279.20	1,901.5	40.5	-199.4	203.4	2.70	2.35	-4.12
2,011.0	20.40	276.40	1,982.2	44.5	-228.7	232.9	1.32	0.70	-3.26
2,096.0	21.60	281.30	2,061.6	49.2	-258.7	263.3	2.50	1.41	5.76
2,182.0	21.80	282.50	2,141.5	55.8	-289.8	295.1	0.57	0.23	1.40
2,267.0	20.60	278.60	2,220.7	61.4	-320.0	325.9	2.18	-1.41	-4.59
2,352.0	20.00	280.60	2,300.5	66.3	-349.1	355.3	1.08	-0.71	2.35
2,438.0	20.80	278.40	2,381.1	71.3	-378.7	385.3	1.29	0.93	-2.56
2,523.0	21.40	278.90	2,460.4	75.9	-408.9	415.9	0.74	0.71	0.59
2,609.0	21.80	281.10	2,540.3	81.4	-440.1	447.5	1.05	0.47	2.56
2,694.0	23.30	279.30	2,618.8	87.1	-472.2	480.1	1.94	1.76	-2.12
2,780.0	22.90	278.40	2,697.9	92.3	-505.5	513.9	0.62	-0.47	-1.05
2,866.0	23.20	279.20	2,777.1	97.5	-538.8	547.5	0.50	0.35	0.93
2,951.0	21.60	277.50	2,855.7	102.2	-570.8	579.9	2.03	-1.88	-2.00
3,037.0	21.30	276.80	2,935.7	106.1	-602.0	611.3	0.46	-0.35	-0.81
3,122.0	21.50	279.10	3,014.8	110.4	-632.7	642.3	1.01	0.24	2.71
3,207.0	21.80	281.80	3,093.8	116.1	-663.6	673.6	1.22	0.35	3.18
3,293.0	19.60	280.80	3,174.3	122.1	-693.4	704.0	2.59	-2.56	-1.16
3,378.0	17.30	282.90	3,254.9	127.6	-719.7	730.9	2.82	-2.71	2.47
3,464.0	16.30	282.80	3,337.2	133.1	-743.9	755.7	1.16	-1.16	-0.12
3,550.0	14.90	278.80	3,420.1	137.5	-766.6	778.9	2.05	-1.63	-4.65
3,635.0	14.90	275.20	3,502.2	140.1	-788.3	800.7	1.09	0.00	-4.24
3,721.0	14.50	282.50	3,585.4	143.5	-809.8	822.4	2.20	-0.47	8.49
3,806.0	16.70	284.90	3,667.3	148.9	-832.0	845.2	2.70	2.59	2.82
3,892.0	16.70	282.70	3,749.6	154.8	-856.0	869.9	0.74	0.00	-2.56
3,977.0	16.70	282.90	3,831.1	160.2	-879.8	894.3	0.07	0.00	0.24
4,063.0	18.10	284.60	3,913.1	166.3	-904.8	920.0	1.73	1.63	1.98
4,148.0	17.90	281.70	3,994.0	172.3	-930.4	946.2	1.08	-0.24	-3.41
4,234.0	17.30	280.10	4,075.9	177.2	-955.9	972.2	0.90	-0.70	-1.86
4,319.0	18.80	278.20	4,156.8	181.4	-981.9	998.5	1.90	1.76	-2.24
4,405.0	20.10	280.80	4,237.8	186.2	-1,010.2	1,027.2	1.82	1.51	3.02
4,491.0	20.60	281.40	4,318.5	191.9	-1,039.5	1,057.1	0.63	0.58	0.70
4,576.0	21.80	282.00	4,397.7	198.2	-1,069.6	1,087.8	1.43	1.41	0.71
4,662.0	22.50	282.40	4,477.4	205.0	-1,101.3	1,120.2	0.83	0.81	0.47
4,747.0	22.30	281.80	4,556.0	211.8	-1,133.0	1,152.6	0.36	-0.24	-0.71
4,833.0	21.40	278.10	4,635.8	217.3	-1,164.5	1,184.6	1.91	-1.05	-4.30
4,919.0	18.90	277.40	4,716.5	221.3	-1,193.8	1,214.1	2.92	-2.91	-0.81
5,004.0	16.70	274.00	4,797.5	224.0	-1,219.7	1,240.0	2.86	-2.59	-4.00
5,090.0	16.00	273.50	4,880.0	225.6	-1,243.8	1,264.1	0.83	-0.81	-0.58
5,175.0	15.50	276.20	4,961.8	227.5	-1,266.8	1,287.1	1.04	-0.59	3.18
5,261.0	14.40	274.50	5,044.9	229.6	-1,288.9	1,309.2	1.38	-1.28	-1.98
5,346.0	12.20	275.10	5,127.6	231.2	-1,308.4	1,328.6	2.59	-2.59	0.71
5,432.0	11.50	279.20	5,211.8	233.4	-1,325.9	1,346.3	1.27	-0.81	4.77
5,517.0	10.10	280.20	5,295.2	236.1	-1,341.6	1,362.2	1.66	-1.65	1.18
5,603.0	8.70	278.30	5,380.1	238.3	-1,355.4	1,376.2	1.67	-1.63	-2.21
5,688.0	6.60	279.00	5,464.3	240.0	-1,366.6	1,387.5	2.47	-2.47	0.82
5,774.0	5.10	274.90	5,549.9	241.1	-1,375.3	1,396.3	1.81	-1.74	-4.77
5,860.0	3.80	275.10	5,635.6	241.7	-1,382.0	1,402.9	1.51	-1.51	0.23
5,945.0	3.20	262.40	5,720.5	241.6	-1,387.1	1,408.0	1.15	-0.71	-14.94
6,024.4	2.50	226.36	5,799.8	240.2	-1,390.6	1,411.1	2.37	-0.88	-45.36
TARGET BHL 1320'FNL, 75'FEL									
6,031.0	2.50	222.80	5,806.4	240.0	-1,390.8	1,411.3	2.37	-0.03	-54.34
6,117.0	0.40	174.60	5,892.3	238.3	-1,392.0	1,412.2	2.62	-2.44	-56.05
6,202.0	0.40	91.20	5,977.3	238.0	-1,391.7	1,411.8	0.63	0.00	-98.12

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<b>Site:</b>	Betz PC G09-31D Pad Sec.9-T4N-R65W	<b>MD Reference:</b>	WELL @ 4725.0ft (Original Well Elev)
<b>Well:</b>	Betz PC G09-31D	<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)
6,287.0	0.30	120.70	6,062.3	237.9	-1,391.2	1,411.3	0.24	-0.12	34.71
6,373.0	0.70	71.00	6,148.3	237.9	-1,390.5	1,410.7	0.65	0.47	-57.79
6,458.0	0.90	83.00	6,233.3	238.2	-1,389.4	1,409.6	0.31	0.24	14.12
6,543.0	1.10	81.30	6,318.3	238.4	-1,387.9	1,408.2	0.24	0.24	-2.00
6,629.0	0.70	58.50	6,404.3	238.8	-1,386.6	1,407.0	0.62	-0.47	-26.51
6,714.0	0.70	46.70	6,489.3	239.4	-1,385.8	1,406.3	0.17	0.00	-13.88
6,800.0	0.70	44.80	6,575.3	240.1	-1,385.1	1,405.7	0.03	0.00	-2.21
6,886.0	0.50	33.20	6,661.3	240.8	-1,384.5	1,405.2	0.27	-0.23	-13.49
6,971.0	0.80	41.30	6,746.3	241.6	-1,383.9	1,404.8	0.37	0.35	9.53
7,029.8	0.66	34.43	6,805.0	242.2	-1,383.4	1,404.4	0.28	-0.24	-11.68
<b>TARGET CIRCLE 1320'FNL, 75'FEL</b>									
7,057.0	0.60	30.20	6,832.3	242.4	-1,383.3	1,404.3	0.28	-0.22	-15.55
7,142.0	0.40	33.70	6,917.3	243.0	-1,382.9	1,404.1	0.24	-0.24	4.12
7,228.0	0.60	62.50	7,003.3	243.5	-1,382.3	1,403.6	0.37	0.23	33.49
7,314.0	0.50	79.80	7,089.3	243.8	-1,381.5	1,402.9	0.22	-0.12	20.12
7,399.0	0.10	34.70	7,174.3	243.9	-1,381.1	1,402.5	0.51	-0.47	-53.06
7,485.0	0.30	37.60	7,260.2	244.1	-1,381.0	1,402.4	0.23	0.23	3.37
<b>HARDLINE 75'E OF BHL</b>									
7,533.0	0.30	37.60	7,308.2	244.3	-1,380.8	1,402.2	0.00	0.00	0.00

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