

Well Name: **Spike State D10-21D**

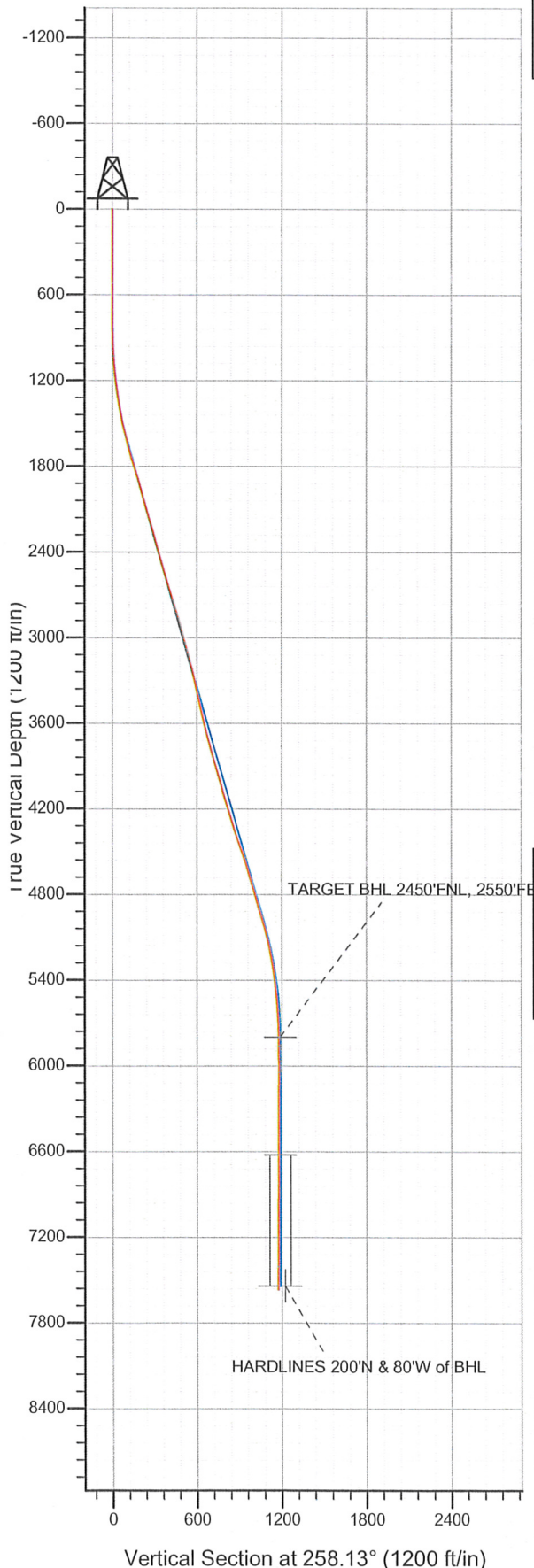
Surface Location: Spike State D10-21D Pad Sec.10-T3N-R64W
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4762.0

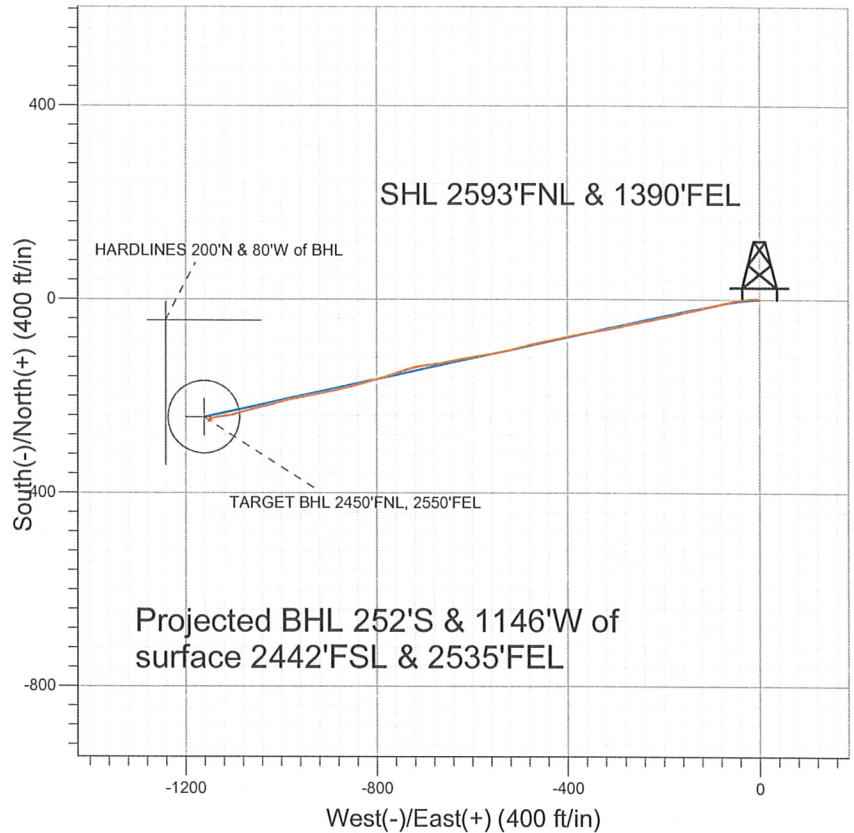
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1331771.85	3270005.33	40° 14' 24.252 N	104° 31' 58.080 W

Original Well Elev WELL @ 4775.0ft (Original Well Elev)

Slot



NOBLE ENERGY INC WELD COUNTY CO



LEGEND

- Spike State D10-21D, Wellbore #1, Noble Spike State D10-21D Plan #3 (7-11-11) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7721'MD & 7565'TVD @ 1174'VS
0.5 deg Inc 118.9 deg AZ

Project: SEC.10-T3N-R64W
Site: Spike State D10-21D Pad Sec.10-T3N-R64W
Well: Spike State D10-21D
Plan: Wellbore #1



Directional

**NOBLE ENERGY INC WELD
COUNTY CO**

SEC.10-T3N-R64W

Spike State D10-21D Pad Sec.10-T3N-R64W

Spike State D10-21D

Wellbore #1

Survey: Survey #1

Standard Survey Report

22 July, 2011



Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.10-T3N-R64W
Site: Spike State D10-21D Pad Sec.10-T3N-R64W
Well: Spike State D10-21D
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Spike State D10-21D
TVD Reference: WELL @ 4775.0ft (Original Well Elev)
MD Reference: WELL @ 4775.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Landmark

Project	SEC.10-T3N-R64W		
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 Spike State D10-21D Pad Sec.10-T3N-R64W

Site Position:		Northing:	1,331,771.86 ft	Latitude:	40° 14' 24.252 N
From:	Lat/Long	Easting:	3,270,005.33 ft	Longitude:	104° 31' 58.080 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.62 °

Well	Spike State D10-21D					
Well Position	+N/-S	0.0 ft	Northing:	1,331,771.85 ft	Latitude:	40° 14' 24.252 N
	+E/-W	0.0 ft	Easting:	3,270,005.33 ft	Longitude:	104° 31' 58.080 W
Position Uncertainty	0.0 ft		Wellhead Elevation:	ft	Ground Level:	4,762.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/8/2011	8.72	66.96	53,066

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	258.13

Survey Program Date 7/22/2011

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
817.0	7,721.0	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
817.0	0.10	317.60	817.0	0.5	-0.5	0.4	0.01	0.01	0.00
902.0	1.10	280.50	902.0	0.7	-1.3	1.2	1.20	1.18	-43.65
988.0	3.00	275.10	987.9	1.1	-4.4	4.1	2.22	2.21	-6.28
1,073.0	4.50	272.60	1,072.8	1.4	-9.9	9.4	1.77	1.76	-2.94
1,159.0	6.10	264.80	1,158.4	1.2	-17.9	17.2	2.04	1.86	-9.07
1,244.0	7.60	260.60	1,242.8	-0.2	-27.9	27.3	1.86	1.76	-4.94
1,330.0	9.00	261.10	1,327.9	-2.1	-40.2	39.7	1.63	1.63	0.58
1,415.0	10.90	259.60	1,411.6	-4.6	-54.6	54.4	2.26	2.24	-1.76
1,501.0	12.80	258.60	1,495.8	-8.0	-72.0	72.1	2.22	2.21	-1.16
1,587.0	14.50	256.50	1,579.3	-12.4	-91.8	92.4	2.06	1.98	-2.44
1,672.0	15.20	256.40	1,661.5	-17.5	-113.0	114.1	0.82	0.82	-0.12
1,758.0	16.90	256.30	1,744.1	-23.1	-136.1	137.9	1.98	1.98	-0.12

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Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Spike State D10-21D
TVD Reference: WELL @ 4775.0ft (Original Well Elev)
MD Reference: WELL @ 4775.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
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)
1,843.0	17.20	257.30	1,825.4	-28.8	-160.3	162.8	0.49	0.35	1.18
1,929.0	16.50	257.10	1,907.7	-34.3	-184.6	187.7	0.82	-0.81	-0.23
2,014.0	16.00	257.00	1,989.3	-39.6	-207.8	211.5	0.59	-0.59	-0.12
2,100.0	15.90	258.60	2,072.0	-44.6	-230.9	235.1	0.52	-0.12	1.86
2,185.0	16.60	258.60	2,153.6	-49.3	-254.2	258.9	0.82	0.82	0.00
2,271.0	16.80	258.40	2,236.0	-54.2	-278.4	283.6	0.24	0.23	-0.23
2,356.0	15.40	257.00	2,317.6	-59.2	-301.5	307.2	1.71	-1.65	-1.65
2,442.0	15.50	260.90	2,400.5	-63.6	-323.9	330.1	1.21	0.12	4.53
2,527.0	15.90	258.90	2,482.4	-67.7	-346.6	353.1	0.79	0.47	-2.35
2,613.0	16.70	260.50	2,564.9	-72.0	-370.3	377.2	1.07	0.93	1.86
2,698.0	17.80	257.30	2,646.1	-76.8	-395.1	402.4	1.71	1.29	-3.76
2,784.0	17.40	258.20	2,728.0	-82.4	-420.5	428.4	0.56	-0.47	1.05
2,869.0	15.90	258.00	2,809.5	-87.4	-444.3	452.8	1.77	-1.76	-0.24
2,955.0	17.30	258.00	2,891.9	-92.5	-468.3	477.3	1.63	1.63	0.00
3,040.0	15.40	254.80	2,973.5	-98.1	-491.6	501.2	2.47	-2.24	-3.76
3,126.0	14.40	256.00	3,056.6	-103.7	-513.0	523.3	1.22	-1.16	1.40
3,211.0	14.90	258.50	3,138.8	-108.4	-533.9	544.8	0.95	0.59	2.94
3,297.0	13.20	260.70	3,222.2	-112.2	-554.5	565.7	2.07	-1.98	2.56
3,382.0	12.00	259.80	3,305.2	-115.3	-572.7	584.2	1.43	-1.41	-1.06
3,468.0	13.10	260.60	3,389.1	-118.5	-591.2	602.9	1.29	1.28	0.93
3,553.0	12.70	262.50	3,472.0	-121.3	-609.9	621.8	0.69	-0.47	2.24
3,639.0	13.10	255.50	3,555.8	-125.0	-628.7	641.0	1.87	0.47	-8.14
3,725.0	14.50	259.10	3,639.3	-129.4	-648.7	661.5	1.91	1.63	4.19
3,810.0	14.00	261.40	3,721.7	-133.0	-669.4	682.4	0.89	-0.59	2.71
3,896.0	16.40	264.00	3,804.7	-135.8	-691.7	704.9	2.90	2.79	3.02
3,981.0	16.80	258.30	3,886.2	-139.6	-715.7	729.1	1.97	0.47	-6.71
4,067.0	16.00	251.80	3,968.7	-145.8	-739.1	753.3	2.33	-0.93	-7.56
4,152.0	15.10	248.70	4,050.6	-153.5	-760.6	775.9	1.44	-1.06	-3.65
4,238.0	17.20	253.60	4,133.2	-161.1	-783.2	799.6	2.91	2.44	5.70
4,323.0	16.60	253.40	4,214.5	-168.1	-806.9	824.2	0.71	-0.71	-0.24
4,409.0	17.20	254.40	4,296.8	-175.1	-830.9	849.2	0.78	0.70	1.16
4,494.0	18.50	256.50	4,377.7	-181.6	-856.1	875.2	1.71	1.53	2.47
4,580.0	20.00	256.70	4,458.9	-188.2	-883.7	903.5	1.75	1.74	0.23
4,665.0	18.10	258.70	4,539.2	-194.1	-910.8	931.3	2.36	-2.24	2.35
4,751.0	17.00	260.30	4,621.2	-198.8	-936.3	957.2	1.40	-1.28	1.86
4,836.0	16.80	258.90	4,702.5	-203.3	-960.6	981.9	0.53	-0.24	-1.65
4,922.0	16.20	257.70	4,785.0	-208.2	-984.5	1,006.3	0.80	-0.70	-1.40
5,007.0	15.60	252.40	4,866.8	-214.2	-1,007.0	1,029.5	1.85	-0.71	-6.24
5,093.0	17.00	257.80	4,949.3	-220.4	-1,030.3	1,053.6	2.40	1.63	6.28
5,178.0	15.70	256.90	5,030.9	-225.6	-1,053.7	1,077.5	1.56	-1.53	-1.06
5,264.0	13.00	252.10	5,114.2	-231.2	-1,074.2	1,098.8	3.43	-3.14	-5.58
5,349.0	10.90	257.90	5,197.3	-235.9	-1,091.2	1,116.3	2.84	-2.47	6.82
5,435.0	9.70	257.50	5,281.9	-239.1	-1,106.2	1,131.7	1.40	-1.40	-0.47
5,520.0	7.90	260.20	5,365.9	-241.7	-1,118.9	1,144.7	2.17	-2.12	3.18
5,606.0	6.30	262.20	5,451.3	-243.3	-1,129.4	1,155.3	1.88	-1.86	2.33
5,691.0	5.30	258.80	5,535.8	-244.7	-1,137.9	1,163.9	1.24	-1.18	-4.00
5,777.0	4.10	256.20	5,621.5	-246.2	-1,144.8	1,171.0	1.42	-1.40	-3.02
5,863.0	2.20	237.90	5,707.4	-247.8	-1,149.2	1,175.6	2.47	-2.21	-21.28
5,948.0	1.10	217.90	5,792.4	-249.3	-1,151.1	1,177.7	1.44	-1.29	-23.53
5,955.7	1.02	218.37	5,800.0	-249.4	-1,151.1	1,177.8	1.08	-1.07	6.13
TARGET BHL 2450°FNL, 2550°FEL									
6,034.0	0.20	245.80	5,878.4	-250.0	-1,151.7	1,178.5	1.08	-1.04	35.01
6,119.0	0.20	231.80	5,963.4	-250.2	-1,152.0	1,178.8	0.06	0.00	-16.47
6,205.0	0.30	188.10	6,049.4	-250.5	-1,152.1	1,179.0	0.24	0.12	-50.81

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Survey

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6,290.0	0.30	177.60	6,134.4	-251.0	-1,152.1	1,179.1	0.06	0.00	-12.35
6,376.0	0.10	221.70	6,220.4	-251.2	-1,152.2	1,179.2	0.28	-0.23	51.28
6,461.0	0.10	172.70	6,305.4	-251.4	-1,152.2	1,179.3	0.10	0.00	-57.65
6,547.0	0.30	139.10	6,391.4	-251.6	-1,152.1	1,179.2	0.26	0.23	-39.07
6,632.0	0.20	114.50	6,476.4	-251.8	-1,151.8	1,178.9	0.17	-0.12	-28.94
6,718.0	0.30	39.10	6,562.4	-251.7	-1,151.5	1,178.6	0.37	0.12	-87.67
6,780.6	0.22	17.08	6,625.0	-251.5	-1,151.4	1,178.5	0.20	-0.13	-35.15
TARGET CIRCLE 2450'FSL & 2550'FEL									
6,803.0	0.20	5.50	6,647.4	-251.4	-1,151.3	1,178.4	0.20	-0.08	-51.79
6,889.0	0.20	35.20	6,733.4	-251.1	-1,151.2	1,178.3	0.12	0.00	34.53
6,974.0	0.30	66.10	6,818.4	-250.9	-1,150.9	1,177.9	0.19	0.12	36.35
7,060.0	0.40	75.80	6,904.4	-250.8	-1,150.5	1,177.4	0.13	0.12	11.28
7,145.0	0.30	81.00	6,989.4	-250.7	-1,149.9	1,176.9	0.12	-0.12	6.12
7,231.0	0.30	80.70	7,075.4	-250.6	-1,149.5	1,176.5	0.00	0.00	-0.35
7,316.0	0.40	122.30	7,160.4	-250.7	-1,149.0	1,176.0	0.31	0.12	48.94
7,402.0	0.30	94.10	7,246.4	-250.9	-1,148.5	1,175.6	0.23	-0.12	-32.79
7,487.0	0.40	119.70	7,331.4	-251.0	-1,148.1	1,175.2	0.22	0.12	30.12
7,573.0	0.60	120.70	7,417.4	-251.4	-1,147.4	1,174.6	0.23	0.23	1.16
7,658.0	0.50	118.90	7,502.4	-251.8	-1,146.7	1,174.0	0.12	-0.12	-2.12
7,696.0	0.50	118.90	7,540.4	-252.0	-1,146.4	1,173.7	0.00	0.00	0.00
HARDLINES 200'N & 80'W of BHL									
7,721.0	0.50	118.90	7,565.3	-252.1	-1,146.2	1,173.6	0.00	0.00	0.00

Checked By: _____	Approved By: _____	Date: _____
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