



Well Name: **Five Rivers K09-30D**

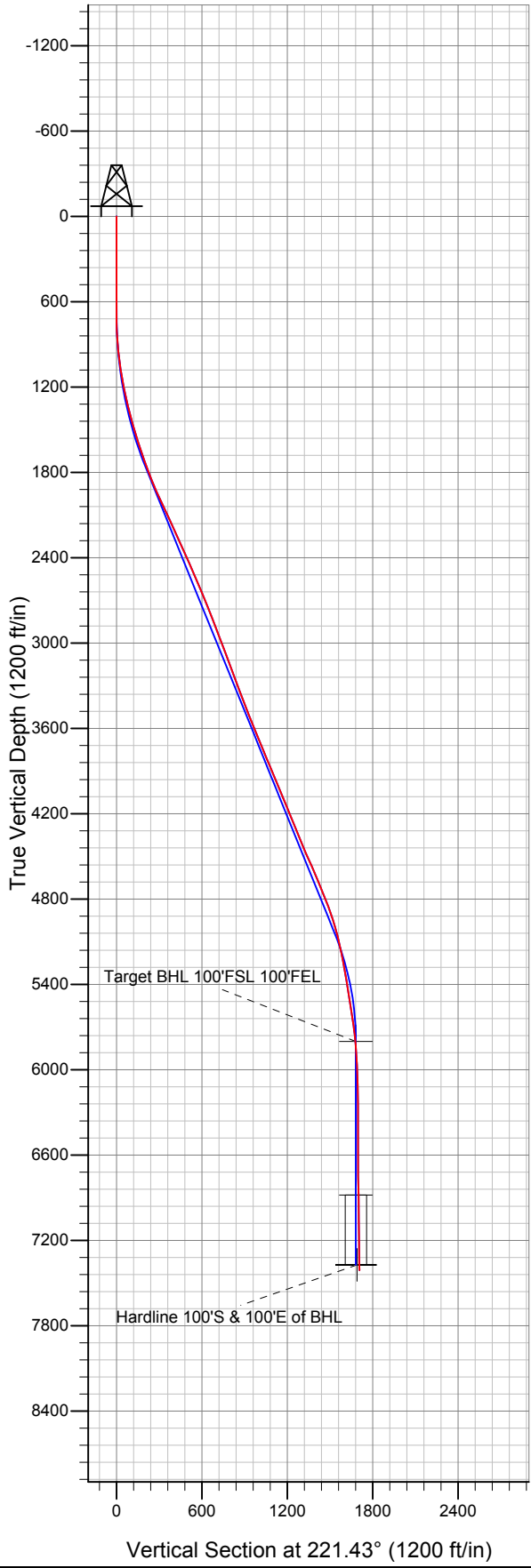
Surface Location: Five Rivers K04-20D Pad Sec.4-T4N-R66W  
 North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4693.0

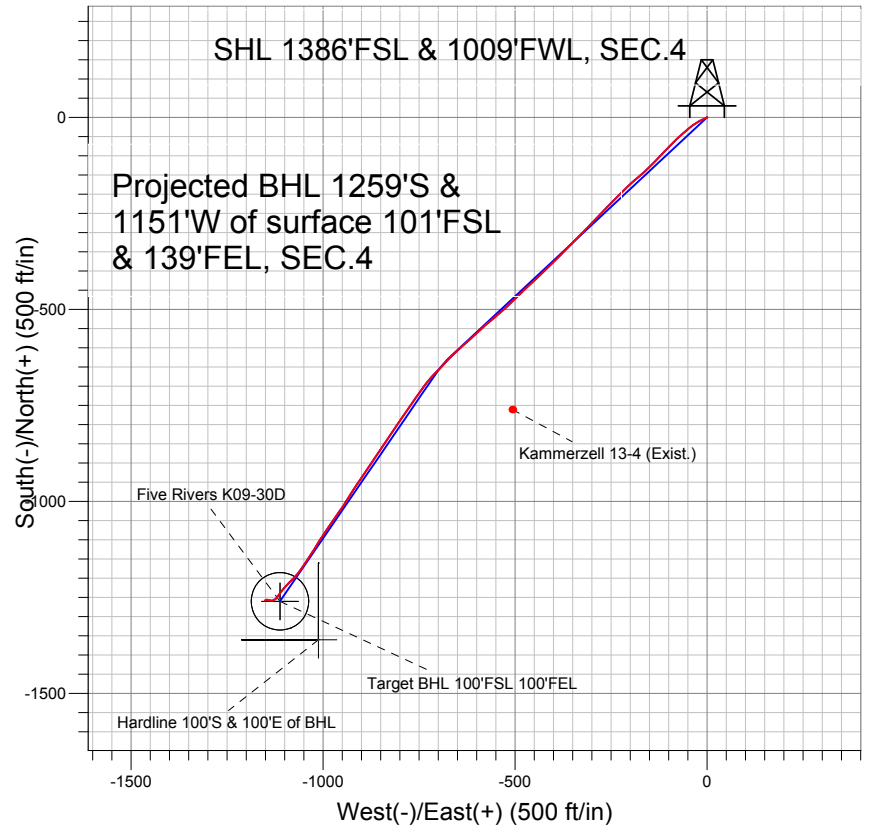
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1366552.03	3197981.34	40° 20' 14.676 N	104° 47' 23.244 W

Original Well Elev WELL @ 4706.0ft (Original Well Elev)

Slot



## NOBLE ENERGY INC WELD COUNTY CO



### LEGEND

- Five Rivers K09-30D, Wellbore #1, Noble Five Rivers K09-30D Plan #1 (1-19-11) V0
- Kammerzell 13-4 (Exist.), Wellbore #1, Design #1 V0
- Wellbore #1
- Survey #1

# Final Survey Plot

Projected Final Survey -  
 7715'MD & 7409'TVD @ 1706'VS  
 0.7 deg Inc 216.5 deg AZ

Project: SEC.4-T4N-R66W  
 Site: Five Rivers K04-20D Pad Sec.4-T4N-R66W  
 Well: Five Rivers K09-30D  
 Plan: Wellbore #1



## Directional

# NOBLE ENERGY INC WELD COUNTY CO

SEC.4-T4N-R66W

Five Rivers K04-20D Pad Sec.4-T4N-R66W

Five Rivers K09-30D

Wellbore #1

Survey: Survey #1

## Standard Survey Report

26 July, 2011



<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Five Rivers K09-30D
<b>Project:</b>	SEC.4-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4706.0ft (Original Well Elev)
<b>Site:</b>	Five Rivers K04-20D Pad Sec.4-T4N-R66W	<b>MD Reference:</b>	WELL @ 4706.0ft (Original Well Elev)
<b>Well:</b>	Five Rivers K09-30D	<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.4-T4N-R66W, 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>	Five Rivers K04-20D Pad Sec.4-T4N-R66W				
<b>Site Position:</b>		<b>Northing:</b>	1,366,571.03ft	<b>Latitude:</b>	40° 20' 14.856 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	3,198,078.76ft	<b>Longitude:</b>	104° 47' 21.984 W
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"	<b>Grid Convergence:</b>	0.46 °

<b>Well</b>	Five Rivers K09-30D					
<b>Well Position</b>	<b>+N-S</b>	0.0 ft	<b>Northing:</b>	1,366,552.03 ft	<b>Latitude:</b>	40° 20' 14.676 N
	<b>+E-W</b>	0.0 ft	<b>Easting:</b>	3,197,981.34 ft	<b>Longitude:</b>	104° 47' 23.244 W
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	ft	<b>Ground Level:</b>	4,693.0 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	1/26/2011	8.92	67.01	53,137

<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	221.43	

<b>Survey Program</b>	<b>Date</b>	7/26/2011			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
659.0	7,715.0	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	
659.0	0.10	77.90	659.0	0.1	0.6	-0.5	0.02	0.02	0.00	
741.0	1.10	225.90	741.0	-0.4	0.1	0.3	1.45	1.22	180.49	
823.0	3.00	244.90	822.9	-1.9	-2.4	3.0	2.43	2.32	23.17	
905.0	4.80	248.70	904.7	-4.0	-7.6	8.0	2.22	2.20	4.63	
986.0	7.10	244.00	985.3	-7.5	-15.2	15.7	2.90	2.84	-5.80	
1,068.0	9.10	240.50	1,066.5	-12.9	-25.4	26.5	2.51	2.44	-4.27	
1,150.0	10.60	230.70	1,147.3	-20.8	-36.9	40.1	2.74	1.83	-11.95	
1,231.0	12.20	231.90	1,226.7	-30.8	-49.4	55.8	2.00	1.98	1.48	
1,313.0	13.80	229.30	1,306.6	-42.6	-63.7	74.0	2.08	1.95	-3.17	
1,395.0	14.10	227.20	1,386.2	-55.7	-78.4	93.7	0.72	0.37	-2.56	
1,477.0	15.50	223.50	1,465.4	-70.5	-93.3	114.5	2.06	1.71	-4.51	
1,558.0	17.00	223.30	1,543.2	-86.9	-108.8	137.2	1.85	1.85	-0.25	

<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>Local Co-ordinate Reference:</b>	Well Five Rivers K09-30D
<b>Project:</b>	SEC.4-T4N-R66W	<b>TVD Reference:</b>	WELL @ 4706.0ft (Original Well Elev)
<b>Site:</b>	Five Rivers K04-20D Pad Sec.4-T4N-R66W	<b>MD Reference:</b>	WELL @ 4706.0ft (Original Well Elev)
<b>Well:</b>	Five Rivers K09-30D	<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)	
1,640.0	18.00	223.20	1,621.4	-104.9	-125.7	161.8	1.22	1.22	-0.12	
1,722.0	19.50	225.70	1,699.0	-123.7	-144.2	188.2	2.07	1.83	3.05	
1,804.0	21.20	229.40	1,775.9	-142.9	-165.3	216.5	2.60	2.07	4.51	
1,885.0	21.90	228.20	1,851.3	-162.5	-187.6	246.0	1.02	0.86	-1.48	
1,967.0	23.50	225.70	1,926.9	-184.1	-210.7	277.5	2.28	1.95	-3.05	
2,049.0	24.80	224.80	2,001.7	-207.7	-234.6	311.0	1.65	1.59	-1.10	
2,130.0	25.20	223.80	2,075.1	-232.2	-258.5	345.2	0.72	0.49	-1.23	
2,212.0	25.00	224.50	2,149.4	-257.2	-282.7	379.9	0.44	-0.24	0.85	
2,294.0	24.80	223.40	2,223.8	-282.0	-306.7	414.4	0.62	-0.24	-1.34	
2,376.0	24.60	224.10	2,298.3	-306.8	-330.4	448.6	0.43	-0.24	0.85	
2,457.0	24.10	224.40	2,372.1	-330.7	-353.7	482.0	0.64	-0.62	0.37	
2,539.0	23.00	226.20	2,447.2	-353.8	-376.9	514.7	1.60	-1.34	2.20	
2,621.0	23.10	224.80	2,522.7	-376.3	-399.8	546.7	0.68	0.12	-1.71	
2,702.0	23.30	225.00	2,597.1	-398.9	-422.4	578.5	0.27	0.25	0.25	
2,784.0	22.80	227.60	2,672.6	-421.1	-445.6	610.5	1.38	-0.61	3.17	
2,866.0	21.90	227.00	2,748.4	-442.2	-468.5	641.5	1.13	-1.10	-0.73	
2,948.0	21.10	225.10	2,824.7	-463.1	-490.1	671.5	1.29	-0.98	-2.32	
3,029.0	21.20	226.00	2,900.3	-483.5	-511.0	700.6	0.42	0.12	1.11	
3,111.0	20.80	228.80	2,976.8	-503.4	-532.6	729.9	1.32	-0.49	3.41	
3,193.0	20.70	230.50	3,053.5	-522.2	-554.7	758.6	0.74	-0.12	2.07	
3,274.0	20.60	229.40	3,129.3	-540.6	-576.6	786.9	0.49	-0.12	-1.36	
3,356.0	21.00	227.00	3,206.0	-560.0	-598.3	815.8	1.15	0.49	-2.93	
3,438.0	20.00	227.50	3,282.8	-579.5	-619.4	844.3	1.24	-1.22	0.61	
3,520.0	21.10	228.10	3,359.6	-598.8	-640.7	872.9	1.37	1.34	0.73	
3,601.0	20.60	225.80	3,435.3	-618.5	-661.8	901.6	1.18	-0.62	-2.84	
3,683.0	21.90	223.00	3,511.7	-639.7	-682.6	931.3	2.01	1.59	-3.41	
3,765.0	22.90	224.60	3,587.5	-662.3	-704.2	962.5	1.43	1.22	1.95	
3,847.0	21.70	220.20	3,663.4	-685.2	-725.2	993.6	2.51	-1.46	-5.37	
3,928.0	22.70	214.90	3,738.4	-709.5	-743.8	1,024.1	2.76	1.23	-6.54	
4,010.0	22.40	215.20	3,814.1	-735.2	-761.8	1,055.4	0.39	-0.37	0.37	
4,092.0	24.00	214.40	3,889.5	-761.8	-780.3	1,087.4	1.99	1.95	-0.98	
4,173.0	22.70	214.30	3,963.8	-788.3	-798.4	1,119.3	1.61	-1.60	-0.12	
4,255.0	22.50	215.20	4,039.5	-814.2	-816.3	1,150.6	0.49	-0.24	1.10	
4,337.0	21.70	213.60	4,115.5	-839.6	-833.8	1,181.2	1.22	-0.98	-1.95	
4,419.0	23.20	212.90	4,191.3	-865.8	-850.9	1,212.2	1.86	1.83	-0.85	
4,500.0	22.00	213.00	4,266.1	-891.9	-867.9	1,243.0	1.48	-1.48	0.12	
4,582.0	22.30	214.70	4,342.0	-917.6	-885.1	1,273.6	0.86	0.37	2.07	
4,664.0	23.00	215.40	4,417.7	-943.4	-903.2	1,305.0	0.91	0.85	0.85	
4,745.0	24.10	212.70	4,492.0	-970.3	-921.3	1,337.1	1.90	1.36	-3.33	
4,827.0	23.40	211.40	4,567.0	-998.2	-938.9	1,369.7	1.07	-0.85	-1.59	
4,909.0	24.10	214.90	4,642.1	-1,025.9	-956.9	1,402.4	1.92	0.85	4.27	
4,991.0	22.00	215.70	4,717.5	-1,052.1	-975.5	1,434.3	2.59	-2.56	0.98	
5,072.0	22.00	212.90	4,792.6	-1,077.1	-992.6	1,464.4	1.29	0.00	-3.46	
5,154.0	20.10	212.70	4,869.1	-1,101.9	-1,008.5	1,493.5	2.32	-2.32	-0.24	
5,236.0	18.20	212.80	4,946.6	-1,124.5	-1,023.1	1,520.1	2.32	-2.32	0.12	
5,317.0	15.20	212.90	5,024.2	-1,144.1	-1,035.7	1,543.1	3.70	-3.70	0.12	
5,399.0	12.70	212.50	5,103.8	-1,160.7	-1,046.4	1,562.6	3.05	-3.05	-0.49	
5,481.0	12.20	216.20	5,183.8	-1,175.3	-1,056.3	1,580.2	1.15	-0.61	4.51	
5,563.0	10.00	217.80	5,264.3	-1,187.9	-1,065.8	1,595.9	2.71	-2.68	1.95	
5,644.0	10.70	224.50	5,344.0	-1,198.8	-1,075.4	1,610.4	1.72	0.86	8.27	
5,726.0	8.70	226.80	5,424.8	-1,208.5	-1,085.3	1,624.2	2.48	-2.44	2.80	
5,808.0	8.20	221.90	5,505.9	-1,217.1	-1,093.7	1,636.2	1.07	-0.61	-5.98	
5,890.0	9.70	219.40	5,586.9	-1,226.8	-1,102.0	1,649.0	1.89	1.83	-3.05	
5,971.0	8.50	218.00	5,666.9	-1,236.8	-1,110.0	1,661.8	1.51	-1.48	-1.73	

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<b>Site:</b>	Five Rivers K04-20D Pad Sec.4-T4N-R66W	<b>MD Reference:</b>	WELL @ 4706.0ft (Original Well Elev)
<b>Well:</b>	Five Rivers K09-30D	<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

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)	
6,053.0	6.00	214.40	5,748.2	-1,245.1	-1,116.1	1,672.1	3.10	-3.05	-4.39	
6,105.5	5.29	217.72	5,800.5	-1,249.3	-1,119.2	1,677.2	1.49	-1.35	6.32	
<b>Target BHL 100'FSL 100'FEL</b>										
6,135.0	4.90	220.00	5,829.9	-1,251.3	-1,120.8	1,679.8	1.49	-1.32	7.73	
6,216.0	4.00	238.00	5,910.6	-1,255.5	-1,125.4	1,686.0	2.04	-1.11	22.22	
6,298.0	2.80	245.70	5,992.5	-1,257.8	-1,129.7	1,690.6	1.56	-1.46	9.39	
6,380.0	1.70	260.80	6,074.4	-1,258.8	-1,132.7	1,693.3	1.51	-1.34	18.41	
6,462.0	1.00	263.00	6,156.4	-1,259.1	-1,134.6	1,694.8	0.86	-0.85	2.68	
6,543.0	0.30	337.70	6,237.4	-1,259.0	-1,135.4	1,695.3	1.19	-0.86	92.22	
6,707.0	0.70	288.80	6,401.4	-1,258.3	-1,136.5	1,695.5	0.34	0.24	-29.82	
6,870.0	1.10	276.80	6,564.3	-1,257.8	-1,139.0	1,696.7	0.27	0.25	-7.36	
7,034.0	1.10	283.20	6,728.3	-1,257.2	-1,142.1	1,698.4	0.07	0.00	3.90	
7,186.1	1.10	277.97	6,880.4	-1,256.7	-1,145.0	1,699.9	0.07	0.00	-3.44	
<b>Target Circle 100'FSL 100'FEL</b>										
7,197.0	1.10	277.60	6,891.3	-1,256.7	-1,145.2	1,700.0	0.07	0.00	-3.43	
7,360.0	0.80	260.70	7,054.3	-1,256.6	-1,147.9	1,701.7	0.25	-0.18	-10.37	
7,524.0	0.70	232.80	7,218.2	-1,257.4	-1,149.8	1,703.6	0.23	-0.06	-17.01	
7,665.0	0.70	216.50	7,359.2	-1,258.6	-1,151.0	1,705.3	0.14	0.00	-11.56	
<b>Hardline 100'S &amp; 100'E of BHL</b>										
7,715.0	0.70	216.50	7,409.2	-1,259.1	-1,151.3	1,705.9	0.00	0.00	0.00	

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