

Noble Energy

Weld County, CO (NAD 83)

Sec. 8-T4N-R66W (Five Rivers K09-25-A)

Five Rivers K07-65HN

Job# 901435874:: API:05-123-39481

Plan A

Design: Actual Survey

Sperry Drilling Services

Final Survey Report

07 August, 2014

Surface UWI : Job# 901435874:: API:05-123-39481

Well Coordinates: 1,362,068.38 N, 3,197,186.35 E (40° 19' 30.43" N, 104° 47' 33.97" W)

Ground Level: 4,699.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Five Rivers K07-65HN

RKB=24ft @ 4723.00usft (H&P 315)

N

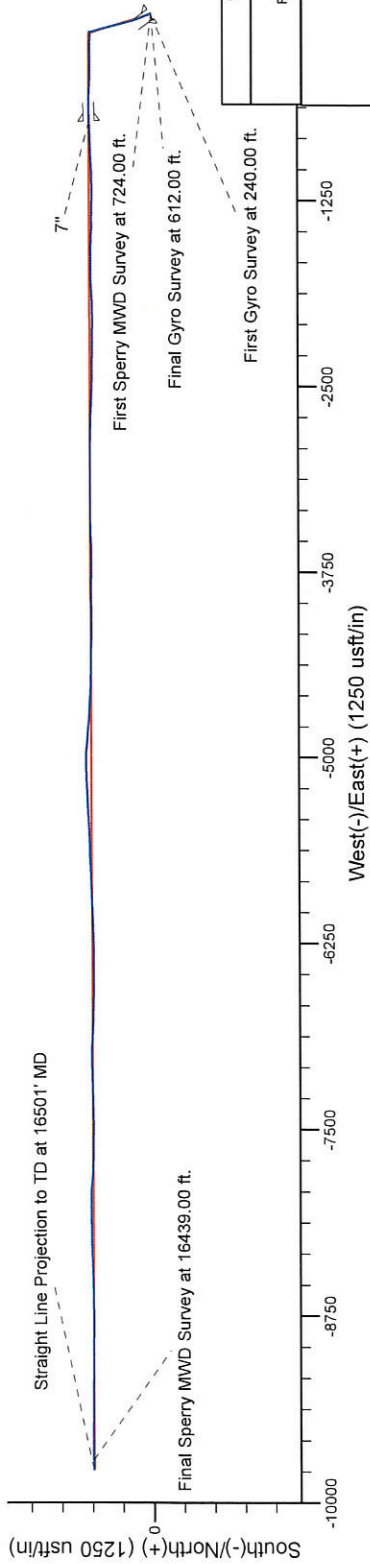
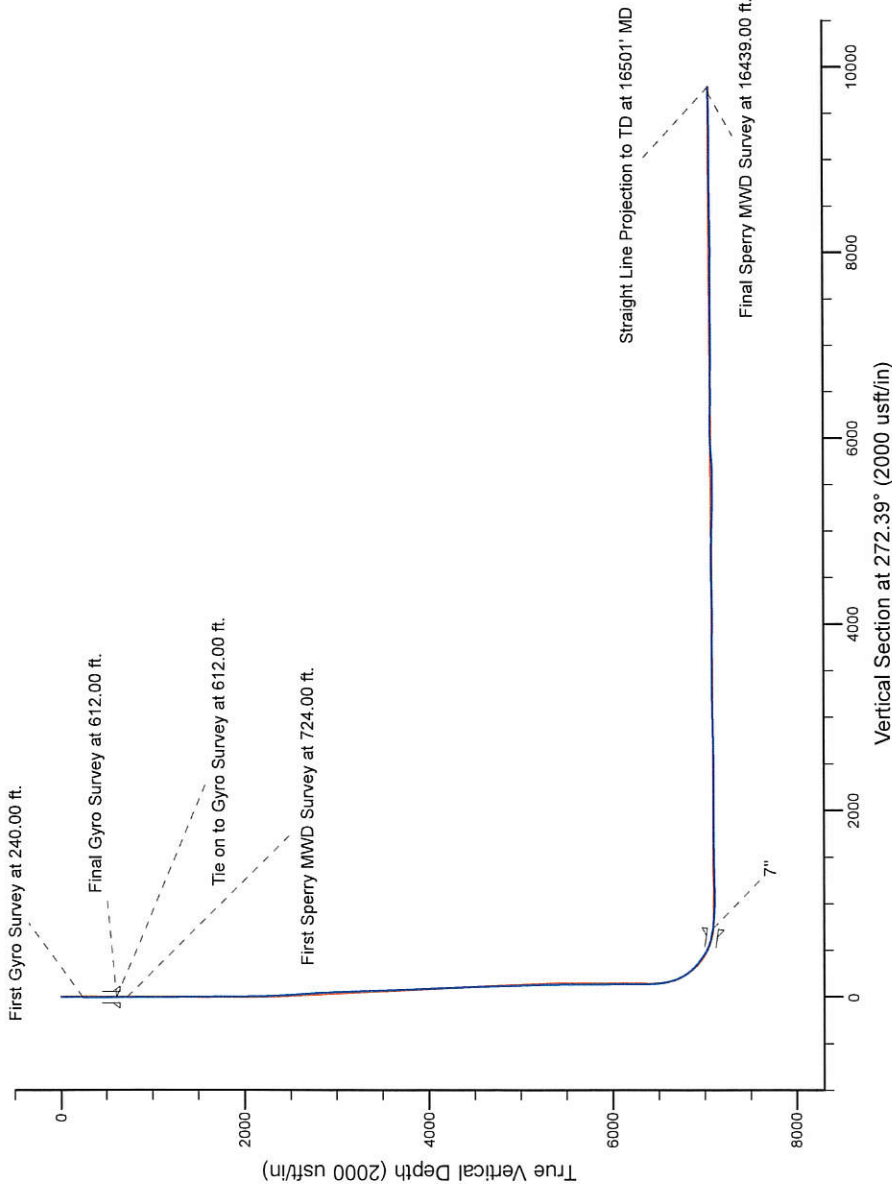
Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Project: Weld County, CO (NAD 83)
Site: Sec. 8-T4N-R66W (Five Rivers K09-25-A)
Well: Five Rivers K07-65HN
Wellbore: Plan A
Design: Actual Survey

Noble Energy



Platted SHL: 2256' FSL, 53' FEL
Platted Lat/Long: 40.32512 N, 104.79277 W
Location: Sec. 8-T4N-R66W

~7" Casing: 2669' FSL, 716' FEL
Lat/Long: 40.326279 N, 104.795326 W
State Planes - CO Northern: 1,362,484.80 N, 3,196,470.42 E
Location: Sec. 7-T4N-R66W

Platted BHL: 2640' FSL, 535' FWL
Lat/Long: 40.32645 N, 104.82783 W
State Planes - CO Northern: 1,362,481.63 N, 3,187,470.75 E
Location: Sec. 7-T4N-R66W

LEGEND

Five Rivers K07-65HN, Plan A, Rev A1 - PROPOSAL V0

Actual Survey

WELL DETAILS: Five Rivers K07-65HN	
Ground Level:	4699.00
RKB=24ft @ 4723.00usft (H&P 315)	
Created By:	Tatiana Gomez
Created On:	08/07/2014

Design Report for Five Rivers K07-65HN - Actual Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UPRR PAN AM #01-61 SHL Uncertainty - Five Rivers K07-65-HN SHL - Five Rivers K07-65-1BHN_SL - Five Rivers K07-61							
240.00	0.50	125.75	240.00	-0.61	0.85	-0.87	0.21
First Gyro Survey at 240.00 ft.							
612.00	0.50	125.75	611.98	-2.51	3.48	-3.59	0.00
Final Gyro Survey at 612.00 ft. - Tie on to Gyro Survey at 612.00 ft.							
652.00	0.42	144.39	651.98	-2.73	3.71	-3.82	0.42
9 5/8"							
724.00	0.43	186.38	723.98	-3.21	3.83	-3.97	0.42
First Sperry MWD Survey at 724.00 ft.							
818.00	0.44	181.10	817.98	-3.92	3.79	-3.95	0.04
913.00	1.05	335.06	912.97	-3.50	3.41	-3.56	1.53
1,008.00	0.90	344.31	1,007.96	-1.99	2.85	-2.93	0.23
1,102.00	0.96	350.53	1,101.95	-0.50	2.52	-2.53	0.12
1,199.00	1.01	340.82	1,198.93	1.11	2.10	-2.05	0.18
1,291.00	1.08	355.23	1,290.92	2.74	1.76	-1.65	0.29
1,385.00	1.13	341.20	1,384.90	4.50	1.39	-1.20	0.29
1,478.00	0.85	332.75	1,477.89	5.98	0.78	-0.53	0.34
1,570.00	1.05	335.15	1,569.87	7.35	0.11	0.19	0.22
1,662.00	1.46	327.16	1,661.85	9.10	-0.88	1.26	0.48
1,755.00	1.16	313.13	1,754.83	10.74	-2.21	2.65	0.47
1,847.00	0.81	310.43	1,846.81	11.80	-3.38	3.87	0.38
1,940.00	0.50	330.96	1,939.81	12.58	-4.08	4.60	0.41
2,032.00	2.26	352.89	2,031.78	14.73	-4.50	5.11	1.96
2,125.00	3.20	350.24	2,124.67	19.11	-5.17	5.96	1.02
2,219.00	4.62	334.73	2,218.45	25.12	-7.23	8.27	1.87
2,311.00	6.44	336.05	2,310.02	33.18	-10.90	12.28	1.98
2,404.00	7.56	338.10	2,402.33	43.62	-15.30	17.11	1.23
2,496.00	7.77	340.16	2,493.50	55.09	-19.67	21.95	0.38
2,591.00	9.83	339.78	2,587.38	68.74	-24.65	27.50	2.17
2,686.00	10.33	339.93	2,680.91	84.35	-30.38	33.87	0.53
2,781.00	9.04	338.57	2,774.56	99.30	-36.03	40.14	1.38
2,876.00	7.67	340.77	2,868.55	112.23	-40.84	45.49	1.48
2,970.00	8.25	348.63	2,961.64	124.77	-44.24	49.41	1.31
3,065.00	7.82	347.02	3,055.71	137.75	-47.03	52.74	0.51
3,160.00	7.20	344.22	3,149.90	149.78	-50.11	56.31	0.76
3,255.00	6.52	343.25	3,244.22	160.67	-53.28	59.94	0.73
3,350.00	7.01	347.38	3,338.55	171.49	-56.10	63.21	0.73
3,445.00	6.12	346.72	3,432.93	182.08	-58.53	66.08	0.94
3,540.00	6.02	340.18	3,527.40	191.69	-61.38	69.33	0.74
3,635.00	6.48	342.87	3,621.83	201.50	-64.65	73.00	0.57
3,730.00	6.19	343.73	3,716.25	211.54	-67.66	76.43	0.32
3,825.00	6.94	345.46	3,810.63	222.01	-70.54	79.74	0.82
3,920.00	6.97	344.77	3,904.93	233.13	-73.50	83.16	0.09
4,015.00	6.46	343.59	3,999.28	243.82	-76.52	86.63	0.56
4,110.00	6.88	343.02	4,093.64	254.39	-79.69	90.24	0.45
4,204.00	7.76	341.13	4,186.87	265.78	-83.39	94.41	0.97
4,299.00	7.89	342.73	4,280.99	278.07	-87.40	98.93	0.27
4,394.00	8.00	346.66	4,375.07	290.73	-90.86	102.91	0.58
4,489.00	8.54	348.00	4,469.09	304.07	-93.85	106.46	0.60

Design Report for Five Rivers K07-65HN - Actual Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,584.00	8.29	347.33	4,563.06	317.65	-96.82	109.99	0.28
4,679.00	7.61	347.04	4,657.15	330.46	-99.73	113.44	0.72
4,774.00	6.86	348.14	4,751.39	342.14	-102.31	116.50	0.80
4,869.00	6.50	344.64	4,845.75	352.88	-104.90	119.54	0.57
4,964.00	6.06	345.01	4,940.18	362.91	-107.62	122.67	0.47
5,058.00	5.62	343.75	5,033.69	372.12	-110.19	125.63	0.49
5,153.00	4.88	341.55	5,128.29	380.42	-112.77	128.55	0.81
5,248.00	4.23	340.70	5,222.99	387.56	-115.21	131.28	0.69
5,343.00	3.54	344.14	5,317.77	393.69	-117.17	133.50	0.77
5,438.00	2.98	341.26	5,412.62	398.85	-118.76	135.31	0.61
5,533.00	2.39	347.47	5,507.51	403.12	-119.99	136.71	0.69
5,628.00	1.93	1.76	5,602.45	406.65	-120.37	137.23	0.74
5,723.00	1.90	14.64	5,697.39	409.77	-119.92	136.92	0.45
5,817.00	1.08	22.78	5,791.36	412.10	-119.18	136.28	0.90
5,912.00	0.61	276.51	5,886.35	412.98	-119.34	136.47	1.45
6,007.00	0.75	266.49	5,981.35	413.00	-120.46	137.59	0.19
6,102.00	0.54	257.51	6,076.34	412.87	-121.52	138.65	0.24
6,197.00	0.76	227.69	6,171.34	412.35	-122.42	139.53	0.42
6,292.00	0.63	215.15	6,266.33	411.49	-123.19	140.26	0.21
6,387.00	0.54	203.61	6,361.32	410.66	-123.67	140.70	0.16
6,427.00	0.49	230.63	6,401.32	410.38	-123.88	140.90	0.61
6,576.00	8.51	269.03	6,549.75	409.78	-135.41	152.40	5.46
6,624.00	12.20	268.82	6,596.96	409.62	-144.04	161.01	7.69
6,671.00	15.51	274.10	6,642.59	409.97	-155.27	172.25	7.53
6,719.00	21.12	273.55	6,688.14	410.96	-170.32	187.32	11.69
6,766.00	25.75	269.68	6,731.25	411.43	-188.99	206.00	10.38
6,814.00	31.04	268.12	6,773.46	410.96	-211.80	228.77	11.13
6,861.00	34.70	269.11	6,812.93	410.36	-237.30	254.22	7.87
6,909.00	39.65	269.66	6,851.16	410.06	-266.29	283.17	10.34
6,956.00	45.21	270.44	6,885.84	410.09	-297.99	314.84	11.88
7,004.00	48.96	270.78	6,918.52	410.47	-333.13	349.97	7.83
7,050.00	50.51	271.47	6,948.25	411.16	-368.23	385.07	3.56
7,098.00	54.40	271.86	6,977.49	412.27	-406.26	423.11	8.13
7,145.00	58.49	271.79	7,003.47	413.52	-445.40	462.27	8.70
7,193.00	62.86	271.85	7,026.97	414.85	-487.22	504.11	9.10
7,240.00	67.44	271.97	7,046.72	416.27	-529.83	546.74	9.75
7,288.00	73.08	271.98	7,062.92	417.83	-574.97	591.90	11.75
7,335.00	77.41	270.04	7,074.89	418.62	-620.40	637.33	10.04
7,377.00	80.42	268.65	7,082.97	418.15	-661.60	678.48	7.87
7,432.00	82.37	267.74	7,091.19	416.43	-715.95	732.71	3.91
7"							
7,502.00	84.86	266.60	7,098.98	413.00	-785.43	801.98	3.91
7,597.00	86.15	267.36	7,106.42	408.01	-880.00	896.26	1.57
7,691.00	89.08	267.94	7,110.33	404.16	-973.83	989.85	3.18
7,786.00	89.35	269.19	7,111.63	401.78	-1,068.79	1,084.63	1.35
7,881.00	91.29	269.23	7,111.10	400.47	-1,163.78	1,179.48	2.04
7,976.00	91.97	270.47	7,108.40	400.22	-1,258.73	1,274.34	1.49
8,071.00	91.08	270.78	7,105.87	401.26	-1,353.69	1,369.26	0.99
8,166.00	91.70	272.22	7,103.57	403.75	-1,448.63	1,464.22	1.65
8,261.00	91.45	271.21	7,100.96	406.59	-1,543.55	1,559.17	1.09
8,355.00	90.28	270.93	7,099.54	408.34	-1,637.52	1,653.14	1.28

Design Report for Five Rivers K07-65HN - Actual Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,450.00	90.52	269.83	7,098.88	408.97	-1,732.52	1,748.08	1.19
8,545.00	89.97	265.84	7,098.47	405.38	-1,827.43	1,842.75	4.24
8,640.00	89.75	267.89	7,098.70	400.19	-1,922.28	1,937.31	2.17
8,735.00	90.46	270.21	7,098.53	398.61	-2,017.26	2,032.14	2.55
8,830.00	89.72	269.60	7,098.38	398.46	-2,112.26	2,127.05	1.01
8,925.00	89.69	270.95	7,098.87	398.91	-2,207.25	2,221.98	1.42
9,020.00	88.74	270.39	7,100.17	400.02	-2,302.24	2,316.93	1.16
9,114.00	89.54	270.88	7,101.58	401.06	-2,396.22	2,410.87	1.00
9,209.00	90.80	271.72	7,101.30	403.22	-2,491.19	2,505.85	1.59
9,304.00	91.45	272.00	7,099.43	406.30	-2,586.12	2,600.83	0.74
9,399.00	90.62	272.61	7,097.72	410.12	-2,681.03	2,695.81	1.08
9,494.00	91.57	271.75	7,095.90	413.74	-2,775.94	2,790.79	1.35
9,586.00	91.63	270.06	7,093.33	415.19	-2,867.89	2,882.72	1.84
9,678.00	90.59	270.60	7,091.55	415.72	-2,959.87	2,974.64	1.27
9,772.00	90.34	270.28	7,090.79	416.44	-3,053.86	3,068.58	0.43
9,865.00	92.16	269.61	7,088.76	416.35	-3,146.84	3,161.47	2.09
9,957.00	91.26	269.81	7,086.01	415.89	-3,238.79	3,253.33	1.00
10,049.00	89.88	269.48	7,085.10	415.32	-3,330.79	3,345.22	1.54
10,142.00	89.60	269.22	7,085.52	414.26	-3,423.78	3,438.08	0.41
10,234.00	90.22	267.87	7,085.66	411.92	-3,515.75	3,529.87	1.61
10,327.00	89.60	269.62	7,085.81	409.89	-3,608.72	3,622.68	2.00
10,419.00	89.32	270.36	7,086.68	409.87	-3,700.72	3,714.60	0.86
10,512.00	90.19	270.64	7,087.07	410.68	-3,793.71	3,807.54	0.98
10,606.00	89.35	270.17	7,087.45	411.35	-3,887.71	3,901.49	1.02
10,699.00	89.38	269.62	7,088.48	411.18	-3,980.70	3,994.39	0.59
10,792.00	90.00	269.03	7,088.99	410.08	-4,073.69	4,087.26	0.92
10,883.00	91.36	270.82	7,087.91	409.96	-4,164.68	4,178.16	2.47
10,976.00	91.05	272.37	7,085.95	412.55	-4,257.62	4,271.13	1.70
11,069.00	91.33	270.82	7,084.02	415.14	-4,350.56	4,364.09	1.69
11,162.00	90.56	270.51	7,082.48	416.22	-4,443.54	4,457.04	0.89
11,255.00	89.88	270.88	7,082.13	417.35	-4,536.53	4,550.00	0.83
11,348.00	90.06	274.13	7,082.18	421.41	-4,629.43	4,642.98	3.50
11,443.00	89.72	274.58	7,082.36	428.62	-4,724.16	4,737.93	0.59
11,538.00	90.31	274.20	7,082.33	435.90	-4,818.88	4,832.87	0.74
11,633.00	89.84	274.63	7,082.21	443.21	-4,913.59	4,927.81	0.67
11,728.00	88.55	270.93	7,083.54	447.82	-5,008.45	5,022.78	4.12
11,823.00	87.19	268.09	7,087.08	447.00	-5,103.37	5,117.58	3.31
11,918.00	88.27	267.11	7,090.84	443.03	-5,198.21	5,212.17	1.53
12,013.00	89.41	267.76	7,092.76	438.78	-5,293.10	5,306.80	1.38
12,108.00	89.66	267.43	7,093.53	434.79	-5,388.01	5,401.46	0.44
12,202.00	90.03	267.49	7,093.79	430.63	-5,481.92	5,495.11	0.40
12,297.00	90.43	267.75	7,093.41	426.68	-5,576.83	5,589.78	0.50
12,392.00	92.71	268.04	7,090.80	423.19	-5,671.73	5,684.45	2.42
12,487.00	94.23	267.19	7,085.05	419.25	-5,766.47	5,778.94	1.83
12,582.00	93.86	267.87	7,078.35	415.16	-5,861.14	5,873.36	0.81
12,676.00	91.94	268.30	7,073.60	412.03	-5,954.96	5,966.97	2.09
12,771.00	90.18	267.27	7,071.84	408.36	-6,049.87	6,061.64	2.15
12,866.00	89.54	268.07	7,072.07	404.49	-6,144.79	6,156.32	1.08
12,961.00	88.52	269.41	7,073.68	402.41	-6,239.75	6,251.11	1.77
13,056.00	88.83	270.37	7,075.88	402.22	-6,334.72	6,345.99	1.06
13,151.00	90.62	270.03	7,076.33	402.56	-6,429.72	6,440.92	1.92

Design Report for Five Rivers K07-65HN - Actual Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
13,246.00	91.33	269.86	7,074.72	402.46	-6,524.70	6,535.82	0.77
13,341.00	89.72	269.85	7,073.85	402.22	-6,619.70	6,630.72	1.69
13,436.00	89.66	271.54	7,074.36	403.38	-6,714.69	6,725.67	1.78
13,531.00	89.20	273.61	7,075.30	407.64	-6,809.58	6,820.66	2.23
13,626.00	89.14	273.39	7,076.68	413.44	-6,904.39	6,915.63	0.24
13,720.00	90.31	270.93	7,077.13	416.99	-6,998.32	7,009.62	2.90
13,815.00	89.66	268.40	7,077.16	416.43	-7,093.31	7,104.51	2.75
13,910.00	90.80	268.53	7,076.78	413.88	-7,188.27	7,199.28	1.21
14,005.00	91.26	267.47	7,075.07	410.57	-7,283.19	7,293.98	1.22
14,100.00	90.83	268.32	7,073.34	407.08	-7,378.11	7,388.67	1.00
14,195.00	90.31	269.14	7,072.39	404.98	-7,473.08	7,483.47	1.02
14,290.00	90.28	270.22	7,071.90	404.45	-7,568.08	7,578.37	1.14
14,385.00	89.51	272.04	7,072.08	406.32	-7,663.06	7,673.34	2.08
14,479.00	89.35	274.15	7,073.01	411.39	-7,756.91	7,767.32	2.25
14,574.00	89.69	274.50	7,073.81	418.56	-7,851.64	7,862.26	0.51
14,669.00	89.32	271.51	7,074.63	423.54	-7,946.49	7,957.24	3.17
14,764.00	90.00	268.76	7,075.19	423.76	-8,041.48	8,052.16	2.98
14,859.00	90.83	269.19	7,074.50	422.06	-8,136.46	8,146.99	0.98
14,954.00	90.93	268.67	7,073.04	420.29	-8,231.43	8,241.80	0.56
15,048.00	91.30	268.57	7,071.21	418.02	-8,325.39	8,335.58	0.41
15,143.00	91.36	267.80	7,069.01	415.02	-8,420.31	8,430.30	0.81
15,238.00	90.77	268.40	7,067.24	411.87	-8,515.24	8,525.01	0.89
15,333.00	90.25	269.09	7,066.40	409.79	-8,610.22	8,619.82	0.91
15,427.00	90.18	269.58	7,066.05	408.70	-8,704.21	8,713.68	0.53
15,523.00	89.32	269.76	7,066.46	408.14	-8,800.21	8,809.57	0.92
15,618.00	89.78	270.25	7,067.21	408.15	-8,895.20	8,904.49	0.71
15,713.00	89.94	270.91	7,067.44	409.11	-8,990.20	8,999.44	0.71
15,808.00	89.66	270.62	7,067.77	410.38	-9,085.19	9,094.40	0.42
15,902.00	90.74	270.32	7,067.45	411.15	-9,179.18	9,188.34	1.19
15,997.00	91.14	270.62	7,065.89	411.93	-9,274.17	9,283.28	0.53
16,092.00	90.71	270.25	7,064.35	412.65	-9,369.15	9,378.21	0.60
16,187.00	91.51	270.99	7,062.51	413.68	-9,464.12	9,473.14	1.15
16,282.00	91.33	269.75	7,060.16	414.29	-9,559.09	9,568.05	1.32
16,377.00	91.95	269.72	7,057.44	413.85	-9,654.05	9,662.91	0.65
16,439.00	92.16	269.20	7,055.22	413.27	-9,716.01	9,724.79	0.90
Final Sperry MWD Survey at 16439.00 ft.							
16,501.00	92.16	269.20	7,052.88	412.40	-9,777.96	9,786.65	0.00
Straight Line Projection to TD at 16501' MD - Five Rivers K07-65-HN BHL							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
240.00	240.00	-0.61	0.85	First Gyro Survey at 240.00 ft.
612.00	611.98	-2.51	3.48	Final Gyro Survey at 612.00 ft.
612.00	611.98	-2.51	3.48	Tie on to Gyro Survey at 612.00 ft.
724.00	723.98	-3.21	3.83	First Sperry MWD Survey at 724.00 ft.
16,439.00	7,055.22	413.27	-9,716.01	Final Sperry MWD Survey at 16439.00 ft.
16,501.00	7,052.88	412.40	-9,777.96	Straight Line Projection to TD at 16501' MD

Design Report for Five Rivers K07-65HN - Actual Survey

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Five Rivers K07-65-HN BHL	272.39	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
240.00	612.00	Surface Surveys	Flexi-Shot
724.00	7,377.00	MWD Surveys - Intermediate	MWD+IFR1+MS_WY
7,502.00	16,439.00	MWD Surveys - Production	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
652.00	651.98	9 5/8"	9-5/8	13-3/4
7,432.00		7"	7	8-3/4

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Five Rivers K07-65-HN	0.00	0.00	0.00	0.01	0.00	1,362,068.39	3,197,186.35	40.325120	-104.792770
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
Five Rivers K07-65-HN	0.00	0.00	0.00	408.49	-9,779.15	1,362,476.86	3,187,407.61	40.326450	-104.827830
- actual wellpath misses target center by 7052.88usft at 16501.00usft MD (7052.88 TVD, 412.40 N, -9777.96 E)									
- Point									
Five Rivers K07-65-1B	0.00	0.00	-1.00	-25.49	0.20	1,362,042.89	3,197,186.55	40.325050	-104.792770
- actual wellpath misses target center by 25.51usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			-1.00	3,114.73	-10,343.34	1,365,157.49	3,186,843.65		
Point 2			-1.00	-2,211.12	-10,283.57	1,359,831.86	3,186,903.42		
Point 3			-1.00	-2,139.05	-5,155.84	1,359,903.93	3,192,030.93		
Point 4			-1.00	3,280.07	-5,404.24	1,365,322.82	3,191,782.54		
Point 5			-1.00	-2,139.05	-5,155.84	1,359,903.93	3,192,030.93		
Point 6			-1.00	-2,234.99	240.92	1,359,808.00	3,197,427.46		
Point 7			-1.00	3,131.50	-206.20	1,365,174.26	3,196,980.36		
Point 8			-1.00	3,280.07	-5,404.24	1,365,322.82	3,191,782.54		
Point 9			-1.00	3,114.73	-10,343.34	1,365,157.49	3,186,843.65		
Five Rivers K07-65-1B	0.00	0.00	-1.00	-25.49	0.20	1,362,042.89	3,197,186.55	40.325050	-104.792770
- actual wellpath misses target center by 25.51usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1			-1.00	2,654.71	-9,883.32	1,364,697.49	3,187,303.65		
Point 2			-1.00	-1,751.11	-9,823.55	1,360,291.86	3,187,363.42		
Point 3			-1.00	-1,679.03	-5,155.84	1,360,363.93	3,192,030.93		
Point 4			-1.00	-1,774.97	-219.10	1,360,268.00	3,196,967.46		
Point 5			-1.00	2,671.48	-666.22	1,364,714.26	3,196,520.36		
Point 6			-1.00	2,820.05	-5,404.24	1,364,862.82	3,191,782.54		
Point 7			-1.00	2,654.71	-9,883.32	1,364,697.49	3,187,303.65		
UPRR PAN AM #01-61	0.00	0.00	-4.00	-327.06	740.98	1,361,741.33	3,197,927.30	40.324206	-104.790122
- actual wellpath misses target center by 809.96usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 300.00)									

Design Report for Five Rivers K07-65HN - Actual Survey

Directional Difficulty Index

Average Dogleg over Survey:	1.53 °/100usft	Maximum Dogleg over Survey:	11.88 °/100usft at 6,956.00 usft
Net Tortosity applicable to Plans:	0.88 °/100usft	Directional Difficulty Index:	6.773

Audit Info

**North Reference Sheet for Sec. 8-T4N-R66W (Five Rivers K09-25-A) - Five Rivers
K07-65HN - Plan A**

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to RKB=24ft @ 4723.00usft (H&P 315). Northing and Easting are relative to Five Rivers K07-65HN

Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995769

Grid Coordinates of Well: 1,362,068.38 usft N, 3,197,186.35 usft E

Geographical Coordinates of Well: 40° 19' 30.43" N, 104° 47' 33.97" W

Grid Convergence at Surface is: 0.46°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,501.00usft
the Bottom Hole Displacement is 9,786.65usft in the Direction of 272.42° (Grid).

Magnetic Convergence at surface is: -8.08° (24 July 2014, , BGGM2014)

