

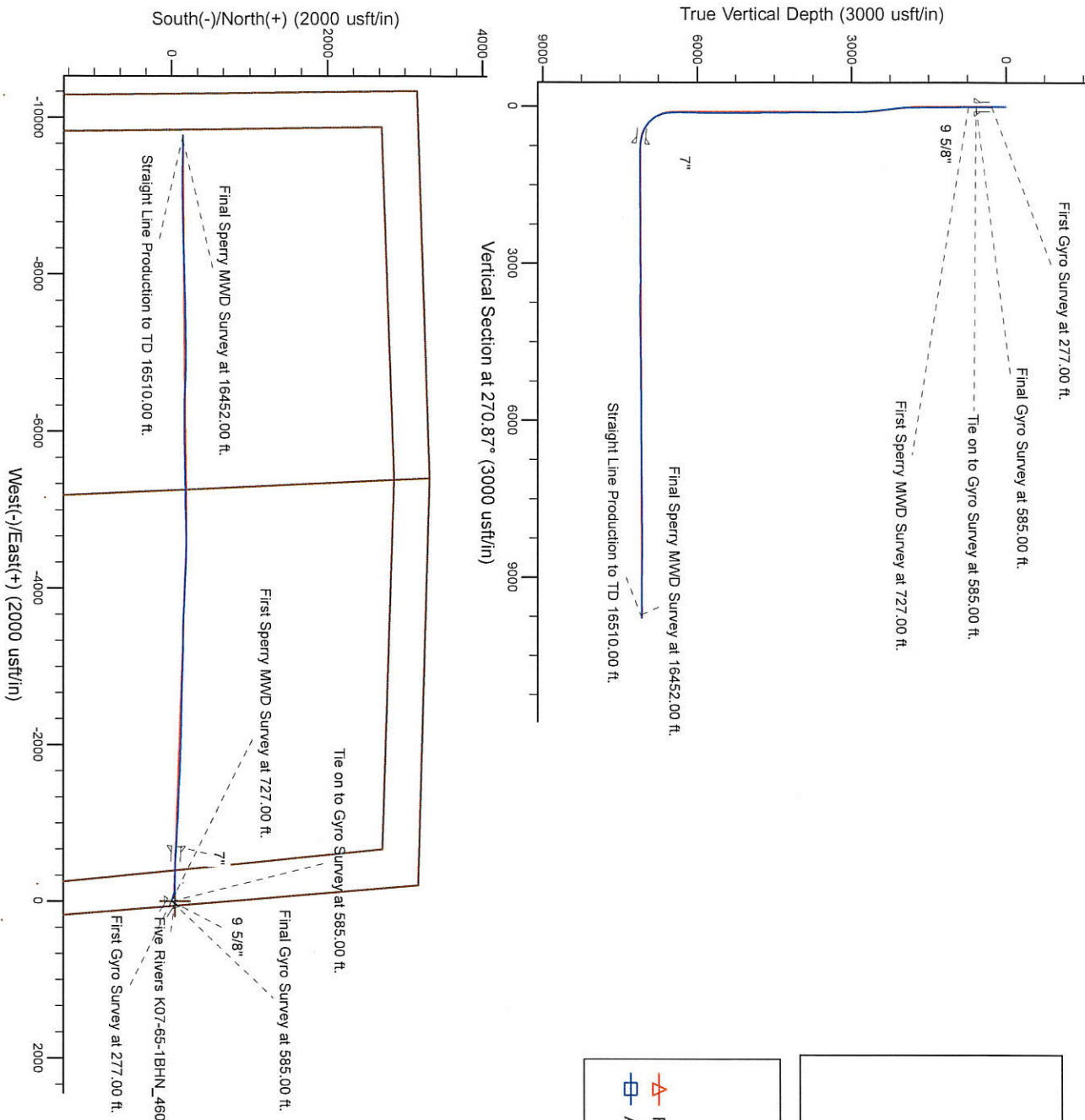
Project: Weld County, CO (NAD 83)
Site: Sec. 8-T4N-R66W (Five Rivers K09-25-A)
Well: Five Rivers K07-65-1HN
Wellbore: Plan C
Design: Actual Surveys

Noble Energy

HALLIBURTON
Sperry Drilling

Platted SHL:	2189 FSL, 58 FEL
Platted Lat/Long:	40.32493 N, 104.79277 W
Location:	Sec. 8-T4N-R66W
~7" Casing:	3124' FNL, 772' FEL
Lat/Long:	40.324938 N, 104.792779 W
State Planes - CO Northern:	1362002.08 N, 3197184.41 E
Location:	Sec. 8-T4N-R66W
Platted BHL:	2310 FSL, 535 FWL
Lat/Long:	40.32555 N, 104.82782 W
State Planes - CO Northern:	1362148.32 N, 3187412.89 E
Location:	Sec. 7-T4N-R66W

Five Rivers K07-65-1HN, Plan C, Rev C0 - PROPOSAL V0
Actual Surveys



WELL DETAILS: Five Rivers K07-65-1HN	
Ground Level:	4700.00
RKB=24ft @ 4724.00usft (H&P 315)	
Created By:	Amanda Marchand
Created On:	10/22/2014

Noble Energy

Weld County, CO (NAD 83)

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

Five Rivers K07-65-1HN

Job# 901436351:: API:05-123-39478

Plan C

Design: Actual Surveys

Sperry Drilling Services

Final Survey Report

22 October, 2014

Surface UWI : Job# 901436351:: API:05-123-39478

Well Coordinates: 1,361,999.17 N, 3,197,186.90 E (40° 19' 29.75" N, 104° 47' 33.97" W)

Ground Level: 4,700.00 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 K07-65-1HN

RKB=24ft @ 4724.00usft (H&P 315)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Five Rivers K07-65-1HN - Actual Surveys

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
277.00	0.50	320.54	277.00	0.93	-0.77	0.78	0.18
First Gyro Survey at 277.00 ft.							
585.00	0.40	318.14	584.99	2.77	-2.34	2.38	0.03
Final Gyro Survey at 585.00 ft. - Tie on to Gyro Survey at 585.00 ft.							
727.00	0.33	185.14	726.99	2.73	-2.71	2.75	0.47
First Sperry MWD Survey at 727.00 ft.							
820.00	0.37	170.08	819.98	2.17	-2.68	2.71	0.11
911.00	0.34	189.71	910.98	1.62	-2.67	2.70	0.14
1,004.00	0.46	198.21	1,003.98	0.99	-2.84	2.85	0.14
1,097.00	0.37	190.81	1,096.98	0.34	-3.01	3.02	0.11
1,203.00	0.18	197.68	1,202.98	-0.16	-3.13	3.12	0.18
1,295.00	0.16	309.33	1,294.98	-0.21	-3.27	3.26	0.31
1,389.00	0.19	55.42	1,388.98	-0.04	-3.24	3.24	0.30
1,481.00	0.17	352.39	1,480.98	0.18	-3.13	3.14	0.21
1,573.00	0.27	283.72	1,572.97	0.37	-3.36	3.37	0.28
1,666.00	0.38	260.39	1,665.97	0.37	-3.88	3.88	0.18
1,759.00	1.60	311.18	1,758.96	1.17	-5.16	5.18	1.50
1,851.00	2.23	309.84	1,850.91	3.16	-7.50	7.55	0.69
1,943.00	3.80	298.67	1,942.78	5.77	-11.55	11.64	1.81
2,036.00	6.13	292.54	2,035.42	9.16	-18.84	18.98	2.57
2,129.00	6.21	292.19	2,127.88	12.96	-28.09	28.28	0.10
2,223.00	7.16	283.47	2,221.25	16.24	-38.49	38.73	1.48
2,315.00	6.57	282.97	2,312.59	18.76	-49.20	49.48	0.64
2,408.00	6.01	282.40	2,405.03	21.00	-59.14	59.45	0.61
2,500.00	6.27	280.77	2,496.50	22.97	-68.78	69.12	0.34
2,593.00	5.85	288.90	2,588.98	25.46	-78.25	78.63	1.03
2,688.00	4.79	296.89	2,683.57	28.82	-86.37	86.80	1.36
2,782.00	3.83	291.13	2,777.30	31.73	-92.80	93.27	1.12
2,877.00	2.41	295.76	2,872.16	33.74	-97.55	98.06	1.52
2,972.00	0.90	321.87	2,967.12	35.19	-99.81	100.34	1.74
3,067.00	0.95	312.29	3,062.11	36.31	-100.86	101.40	0.17
3,162.00	0.94	327.70	3,157.09	37.50	-101.86	102.42	0.27
3,257.00	0.81	341.57	3,252.08	38.80	-102.48	103.06	0.26
3,352.00	0.81	346.83	3,347.07	40.09	-102.85	103.45	0.08
3,447.00	0.67	352.79	3,442.07	41.29	-103.07	103.69	0.17
3,542.00	0.59	321.37	3,537.06	42.22	-103.45	104.08	0.37
3,637.00	0.65	350.57	3,632.06	43.14	-103.84	104.49	0.33
3,732.00	1.05	358.87	3,727.05	44.54	-103.95	104.61	0.44
3,827.00	1.25	358.67	3,822.03	46.45	-103.99	104.68	0.21
3,922.00	1.11	359.35	3,917.01	48.40	-104.02	104.75	0.15
4,017.00	0.96	345.49	4,011.99	50.09	-104.23	104.98	0.31
4,112.00	0.71	334.11	4,106.98	51.39	-104.69	105.46	0.31
4,207.00	0.66	323.02	4,201.97	52.36	-105.28	106.06	0.15
4,301.00	0.53	258.00	4,295.97	52.70	-106.03	106.82	0.69
4,396.00	0.88	249.53	4,390.96	52.35	-107.14	107.93	0.38
4,491.00	0.96	240.91	4,485.95	51.71	-108.52	109.29	0.17
4,586.00	1.29	255.90	4,580.93	51.07	-110.25	111.02	0.46
4,681.00	1.45	280.67	4,675.91	51.03	-112.47	113.23	0.64
4,776.00	1.20	284.62	4,770.88	51.50	-114.61	115.39	0.28

Design Report for Five Rivers K07-65-1HN - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,870.00	0.93	184.86	4,864.87	50.99	-115.63	116.39	1.74
4,965.00	1.01	195.46	4,959.86	49.41	-115.92	116.66	0.21
5,060.00	0.83	192.47	5,054.84	47.94	-116.29	117.01	0.20
5,155.00	0.67	201.79	5,149.84	46.75	-116.65	117.34	0.21
5,250.00	0.64	196.46	5,244.83	45.72	-117.00	117.69	0.07
5,345.00	0.75	206.82	5,339.82	44.66	-117.43	118.10	0.18
5,440.00	1.09	186.76	5,434.81	43.21	-117.82	118.46	0.49
5,535.00	0.59	136.44	5,529.80	41.96	-117.59	118.22	0.89
5,629.00	0.54	112.32	5,623.80	41.44	-116.85	117.46	0.26
5,724.00	0.82	91.17	5,718.79	41.25	-115.75	116.37	0.39
5,819.00	0.85	90.87	5,813.78	41.23	-114.37	114.98	0.03
5,914.00	0.65	89.88	5,908.77	41.22	-113.12	113.74	0.21
6,009.00	0.76	93.17	6,003.76	41.18	-111.96	112.57	0.12
6,104.00	0.77	97.50	6,098.76	41.07	-110.69	111.31	0.06
6,198.00	0.88	90.71	6,192.75	40.98	-109.35	109.96	0.16
6,293.00	0.83	91.24	6,287.74	40.95	-107.93	108.54	0.05
6,388.00	0.75	79.16	6,382.73	41.05	-106.63	107.24	0.19
6,531.00	3.20	283.61	6,525.66	42.17	-109.59	110.22	2.72
6,577.00	6.02	276.74	6,571.51	42.75	-113.24	113.87	6.24
6,625.00	11.45	270.85	6,618.94	43.12	-120.50	121.15	11.45
6,672.00	18.20	268.94	6,664.35	43.05	-132.52	133.16	14.40
6,720.00	22.65	272.47	6,709.32	43.31	-149.26	149.90	9.62
6,768.00	25.91	273.88	6,753.07	44.42	-168.96	169.62	6.90
6,816.00	30.21	271.88	6,795.42	45.53	-191.50	192.18	9.17
6,863.00	35.02	272.47	6,834.99	46.50	-216.81	217.50	10.26
6,911.00	40.48	272.51	6,872.93	47.77	-246.16	246.86	11.38
6,958.00	45.31	271.24	6,907.36	48.81	-278.12	278.83	10.44
7,006.00	48.57	269.55	6,940.13	49.03	-313.19	313.90	7.26
7,052.00	52.67	268.58	6,969.30	48.44	-348.73	349.43	9.06
7,100.00	57.89	270.06	6,996.64	47.99	-388.16	388.85	11.17
7,147.00	63.14	271.32	7,019.76	48.50	-429.06	429.75	11.41
7,195.00	67.20	271.71	7,039.91	49.65	-472.60	473.30	8.49
7,242.00	70.65	272.74	7,056.81	51.36	-516.41	517.13	7.62
7,290.00	74.44	273.42	7,071.21	53.82	-562.13	562.88	8.01
7,337.00	78.00	273.50	7,082.40	56.57	-607.68	608.48	7.58
7,393.00	82.48	272.99	7,091.89	59.70	-662.77	663.60	8.05
7,537.00	88.80	273.64	7,102.83	68.00	-806.04	806.98	4.41
7,632.00	88.92	272.61	7,104.72	73.18	-900.88	901.89	1.09
7,727.00	90.65	273.30	7,105.08	78.07	-995.75	996.82	1.96
7,822.00	90.71	273.89	7,103.95	84.03	-1,090.55	1,091.71	0.62
7,916.00	90.09	272.20	7,103.30	89.02	-1,184.41	1,185.63	1.91
8,011.00	90.09	272.47	7,103.15	92.89	-1,279.33	1,280.60	0.28
8,106.00	88.89	271.18	7,103.99	95.92	-1,374.28	1,375.58	1.85
8,201.00	90.03	273.36	7,104.89	99.68	-1,469.19	1,470.54	2.59
8,296.00	90.15	272.33	7,104.74	104.40	-1,564.07	1,565.48	1.09
8,391.00	89.51	272.49	7,105.02	108.39	-1,658.99	1,660.45	0.69
8,486.00	91.73	273.34	7,103.99	113.22	-1,753.85	1,755.38	2.50
8,580.00	90.52	272.03	7,102.15	117.62	-1,847.73	1,849.31	1.90
8,675.00	90.43	271.04	7,101.36	120.17	-1,942.69	1,944.30	1.05
8,770.00	89.94	272.16	7,101.05	122.82	-2,037.65	2,039.29	1.29
8,865.00	90.40	270.80	7,100.77	125.27	-2,132.62	2,134.28	1.51

Design Report for Five Rivers K07-65-1HN - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,960.00	90.06	271.04	7,100.39	126.80	-2,227.60	2,229.28	0.44
9,055.00	90.25	271.76	7,100.13	129.12	-2,322.57	2,324.27	0.78
9,150.00	89.72	271.75	7,100.16	132.03	-2,417.53	2,419.26	0.56
9,245.00	89.44	272.17	7,100.85	135.28	-2,512.47	2,514.24	0.53
9,339.00	89.01	272.02	7,102.13	138.71	-2,606.40	2,608.21	0.48
9,434.00	89.20	271.04	7,103.61	141.25	-2,701.35	2,703.19	1.05
9,529.00	90.12	270.83	7,104.17	142.80	-2,796.34	2,798.19	0.99
9,621.00	90.99	271.11	7,103.28	144.36	-2,888.32	2,890.18	0.99
9,714.00	93.21	271.35	7,099.87	146.35	-2,981.23	2,983.11	2.40
9,807.00	91.60	271.40	7,095.97	148.58	-3,074.12	3,076.03	1.73
9,900.00	92.56	271.34	7,092.60	150.80	-3,167.03	3,168.96	1.03
9,992.00	88.95	270.13	7,091.38	151.98	-3,259.00	3,260.93	4.14
10,084.00	87.44	269.95	7,094.28	152.05	-3,350.95	3,352.88	1.65
10,177.00	86.95	270.88	7,098.83	152.72	-3,443.83	3,445.76	1.13
10,270.00	87.87	271.41	7,103.04	154.58	-3,536.72	3,538.66	1.14
10,362.00	89.60	272.55	7,105.07	157.76	-3,628.63	3,630.62	2.25
10,455.00	90.00	273.56	7,105.39	162.71	-3,721.50	3,723.55	1.17
10,547.00	91.42	274.31	7,104.25	169.02	-3,813.27	3,815.41	1.75
10,641.00	90.68	271.08	7,102.53	173.44	-3,907.14	3,909.33	3.52
10,734.00	91.11	271.64	7,101.08	175.65	-4,000.10	4,002.32	0.76
10,827.00	90.92	272.27	7,099.43	178.82	-4,093.03	4,095.29	0.71
10,919.00	90.65	272.07	7,098.17	182.31	-4,184.96	4,187.25	0.37
11,011.00	90.99	273.58	7,096.85	186.84	-4,276.83	4,279.19	1.68
11,104.00	90.83	271.63	7,095.37	191.07	-4,369.72	4,372.13	2.10
11,197.00	90.52	271.36	7,094.28	193.49	-4,462.68	4,465.12	0.44
11,290.00	90.99	271.45	7,093.05	195.77	-4,555.65	4,558.10	0.51
11,384.00	90.28	269.63	7,092.01	196.66	-4,649.63	4,652.09	2.08
11,478.00	90.12	267.47	7,091.68	194.28	-4,743.60	4,746.01	2.30
11,574.00	90.86	269.23	7,090.86	191.51	-4,839.55	4,841.91	1.99
11,668.00	90.28	267.81	7,089.93	189.09	-4,933.51	4,935.82	1.63
11,763.00	90.06	267.56	7,089.65	185.25	-5,028.43	5,030.67	0.35
11,858.00	90.49	269.96	7,089.19	183.19	-5,123.40	5,125.60	2.57
11,953.00	90.43	270.51	7,088.43	183.58	-5,218.40	5,220.59	0.58
12,048.00	90.25	268.95	7,087.86	183.14	-5,313.39	5,315.57	1.65
12,143.00	90.06	268.49	7,087.61	181.01	-5,408.37	5,410.50	0.52
12,237.00	91.02	269.80	7,086.72	179.61	-5,502.35	5,504.45	1.73
12,332.00	91.20	269.61	7,084.88	179.12	-5,597.33	5,599.41	0.28
12,427.00	91.14	269.30	7,082.94	178.22	-5,692.31	5,694.36	0.33
12,522.00	90.49	268.57	7,081.59	176.45	-5,787.28	5,789.30	1.03
12,617.00	89.63	267.78	7,081.49	173.43	-5,882.23	5,884.19	1.23
12,712.00	89.69	268.02	7,082.05	169.95	-5,977.16	5,979.06	0.26
12,807.00	90.15	269.54	7,082.19	167.92	-6,072.14	6,073.99	1.67
12,901.00	90.55	270.67	7,081.61	168.10	-6,166.14	6,167.98	1.28
12,996.00	90.37	270.79	7,080.85	169.31	-6,261.12	6,262.98	0.23
13,091.00	89.97	271.58	7,080.57	171.27	-6,356.10	6,357.98	0.93
13,186.00	89.75	272.76	7,080.80	174.87	-6,451.03	6,452.95	1.26
13,281.00	89.44	273.17	7,081.47	179.78	-6,545.90	6,547.88	0.54
13,376.00	89.54	272.15	7,082.32	184.19	-6,640.80	6,642.83	1.08
13,471.00	89.60	271.67	7,083.03	187.36	-6,735.74	6,737.81	0.51
13,566.00	90.43	270.98	7,083.00	189.55	-6,830.71	6,832.81	1.14
13,661.00	91.51	269.79	7,081.40	190.19	-6,925.69	6,927.79	1.69

Design Report for Five Rivers K07-65-1HN - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
13,756.00	91.76	269.43	7,078.68	189.55	-7,020.65	7,022.73	0.46
13,851.00	92.25	268.79	7,075.36	188.07	-7,115.58	7,117.62	0.85
13,945.00	91.29	268.49	7,072.46	185.84	-7,209.51	7,211.51	1.07
14,040.00	90.56	268.55	7,070.92	183.39	-7,304.47	7,306.41	0.77
14,135.00	90.65	269.88	7,069.92	182.09	-7,399.45	7,401.37	1.40
14,230.00	90.49	269.20	7,068.98	181.32	-7,494.44	7,496.33	0.74
14,325.00	90.86	268.82	7,067.86	179.68	-7,589.42	7,591.28	0.56
14,420.00	90.46	269.53	7,066.76	178.31	-7,684.40	7,686.23	0.86
14,515.00	89.75	268.32	7,066.59	176.53	-7,779.38	7,781.17	1.48
14,610.00	89.26	267.32	7,067.41	172.92	-7,874.31	7,876.03	1.17
14,705.00	90.52	268.68	7,067.59	169.60	-7,969.25	7,970.91	1.95
14,800.00	90.62	268.14	7,066.65	166.97	-8,064.21	8,065.81	0.58
14,894.00	90.31	268.86	7,065.88	164.51	-8,158.17	8,159.73	0.83
14,989.00	90.74	268.80	7,065.01	162.57	-8,253.15	8,254.67	0.46
15,084.00	90.34	268.75	7,064.12	160.54	-8,348.12	8,349.60	0.42
15,178.00	90.71	268.81	7,063.26	158.54	-8,442.09	8,443.53	0.40
15,273.00	89.48	268.15	7,063.10	156.02	-8,537.06	8,538.44	1.47
15,368.00	89.48	266.98	7,063.96	151.98	-8,631.97	8,633.28	1.23
15,463.00	88.89	268.69	7,065.31	148.39	-8,726.89	8,728.13	1.90
15,558.00	89.07	268.76	7,067.00	146.28	-8,821.85	8,823.05	0.20
15,653.00	88.09	268.76	7,069.36	144.22	-8,916.79	8,917.96	1.03
15,747.00	87.84	268.98	7,072.70	142.37	-9,010.72	9,011.84	0.35
15,842.00	87.72	269.74	7,076.38	141.31	-9,105.64	9,106.73	0.81
15,937.00	89.32	271.04	7,078.83	141.96	-9,200.60	9,201.69	2.17
16,032.00	89.10	270.79	7,080.14	143.47	-9,295.58	9,296.69	0.35
16,127.00	92.13	271.50	7,079.12	145.37	-9,390.54	9,391.67	3.28
16,222.00	90.83	270.97	7,076.67	147.42	-9,485.49	9,486.63	1.48
16,317.00	90.34	269.62	7,075.70	147.91	-9,580.48	9,581.62	1.51
16,452.00	90.12	269.64	7,075.15	147.03	-9,715.47	9,716.59	0.16
Final Sperry MWD Survey at 16452.00 ft.							
16,510.00	90.12	269.64	7,075.03	146.67	-9,773.47	9,774.57	0.00
Straight Line Production to TD 16510.00 ft.							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
277.00	277.00	0.93	-0.77	First Gyro Survey at 277.00 ft.
585.00	584.99	2.77	-2.34	Final Gyro Survey at 585.00 ft.
585.00	584.99	2.77	-2.34	Tie on to Gyro Survey at 585.00 ft.
727.00	726.99	2.73	-2.71	First Sperry MWD Survey at 727.00 ft.
16,452.00	7,075.15	147.03	-9,715.47	Final Sperry MWD Survey at 16452.00 ft.
16,510.00	7,075.03	146.67	-9,773.47	Straight Line Production to TD 16510.00 ft.

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	+N/-S (usft)	+E/-W (usft)	Start TVD (usft)
Target	Five Rivers K07-65-1HN BHL	270.87	Slot	0.00	0.00	0.00

Design Report for Five Rivers K07-65-1HN - Actual Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
277.00	585.00	Gyro Surveys	Flexi-Shot
727.00	7,393.00	MWD Surveys - Intermediate	MWD+IFR1+MS_WY
7,537.00	16,510.00	MWD Surveys - Production	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
621.00	620.99	9 5/8"	9-5/8	13-3/4
7,439.00	7,097.11	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 K07-65-1B	0.00	0.00	0.00	43.72	-0.35	1,362,042.89	3,197,186.55	40.325050	-104.792770
- actual wellpath misses target center by 43.73usft at 0.15usft MD (0.15 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	3,114.73	-10,343.34	1,365,157.49	3,186,843.65	
Point 2				0.00	-2,211.12	-10,283.57	1,359,831.86	3,186,903.42	
Point 3				0.00	-2,139.05	-5,155.84	1,359,903.93	3,192,030.93	
Point 4				0.00	3,280.07	-5,404.24	1,365,322.82	3,191,782.54	
Point 5				0.00	-2,139.05	-5,155.84	1,359,903.93	3,192,030.93	
Point 6				0.00	-2,234.99	240.92	1,359,808.00	3,197,427.46	
Point 7				0.00	3,131.50	-206.20	1,365,174.26	3,196,980.36	
Point 8				0.00	3,280.07	-5,404.24	1,365,322.82	3,191,782.54	
Point 9				0.00	3,114.73	-10,343.34	1,365,157.49	3,186,843.65	
Five Rivers K07-65-1B	0.00	0.00	0.00	43.72	-0.35	1,362,042.89	3,197,186.55	40.325050	-104.792770
- actual wellpath misses target center by 43.73usft at 0.15usft MD (0.15 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	2,654.71	-9,883.32	1,364,697.49	3,187,303.65	
Point 2				0.00	-1,751.11	-9,823.55	1,360,291.86	3,187,363.42	
Point 3				0.00	-1,679.03	-5,155.84	1,360,363.93	3,192,030.93	
Point 4				0.00	-1,774.97	-219.10	1,360,268.00	3,196,967.46	
Point 5				0.00	2,671.48	-666.22	1,364,714.26	3,196,520.36	
Point 6				0.00	2,820.05	-5,404.24	1,364,862.82	3,191,782.54	
Point 7				0.00	2,654.71	-9,883.32	1,364,697.49	3,187,303.65	
Five Rivers K07-65-1H	0.00	0.00	0.00	0.01	0.00	1,361,999.18	3,197,186.90	40.324930	-104.792770
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
UPRR PAN AM #01-61	0.00	0.00	-3.00	-257.85	740.43	1,361,741.33	3,197,927.30	40.324206	-104.790122
- actual wellpath misses target center by 784.05usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Circle (radius 300.00)									
Five Rivers K07-65-1H	0.00	0.00	7,069.87	149.16	-9,774.43	1,362,148.32	3,187,412.89	40.325548	-104.827820
- actual wellpath misses target center by 5.81usft at 16510.00usft MD (7075.03 TVD, 146.67 N, -9773.47 E)									
- Point									
Kammerzell ED 3-28_I	0.00	0.00	7,088.00	195.00	-4,552.31	1,362,194.16	3,192,634.78	40.325564	-104.809090
- actual wellpath misses target center by 5.16usft at 11286.71usft MD (7093.11 TVD, 195.69 N, -4552.36 E)									
- Point									

Design Report for Five Rivers K07-65-1HN - Actual Surveys

Directional Difficulty Index

Average Dogleg over Survey:	1.38 °/100usft	Maximum Dogleg over Survey:	14.40 °/100usft at 6,672.00 usft
Net Tortosity applicable to Plans:	0.73 °/100usft	Directional Difficulty Index:	6.715

Audit Info

**North Reference Sheet for Sec. 8-T4N-R66W (Five Rivers K09-25-A) - Five Rivers
K07-65-1HN - Plan C**

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 @ 4724.00usft (H&P 315). Northing and Easting are relative to Five Rivers K07-65-1HN

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: 0.99995768

Grid Coordinates of Well: 1,361,999.17 usft N, 3,197,186.90 usft E

Geographical Coordinates of Well: 40° 19' 29.75" N, 104° 47' 33.97" W

Grid Convergence at Surface is: 0.46°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,510.00usft
the Bottom Hole Displacement is 9,774.57usft in the Direction of 270.86° (Grid).

Magnetic Convergence at surface is: -8.07° (24 August 2014, , BGGM2014)

