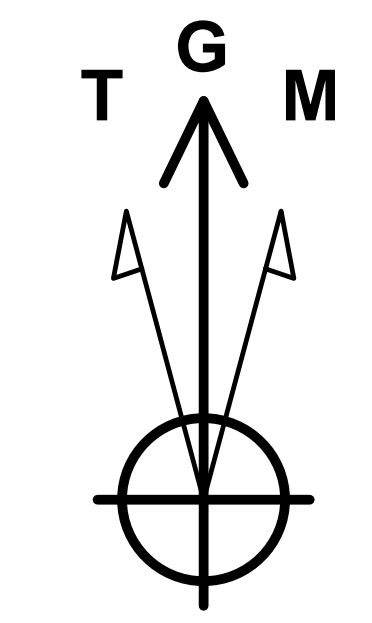


WELL DETAILS  
Ground Level: 5479.00  
+N/-S 0.00 +E/-W 0.00 Northing 1154929.09 Easting 3219732.92 Latitude 39.7559889 Longitude -104.7184560

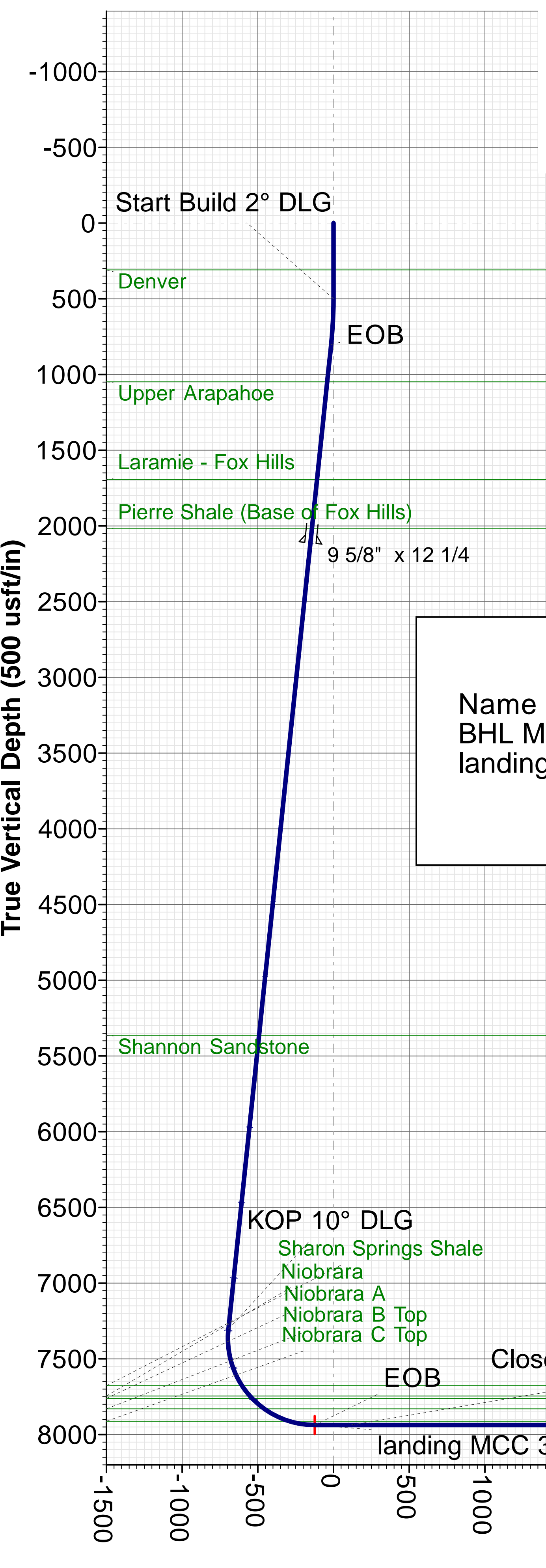
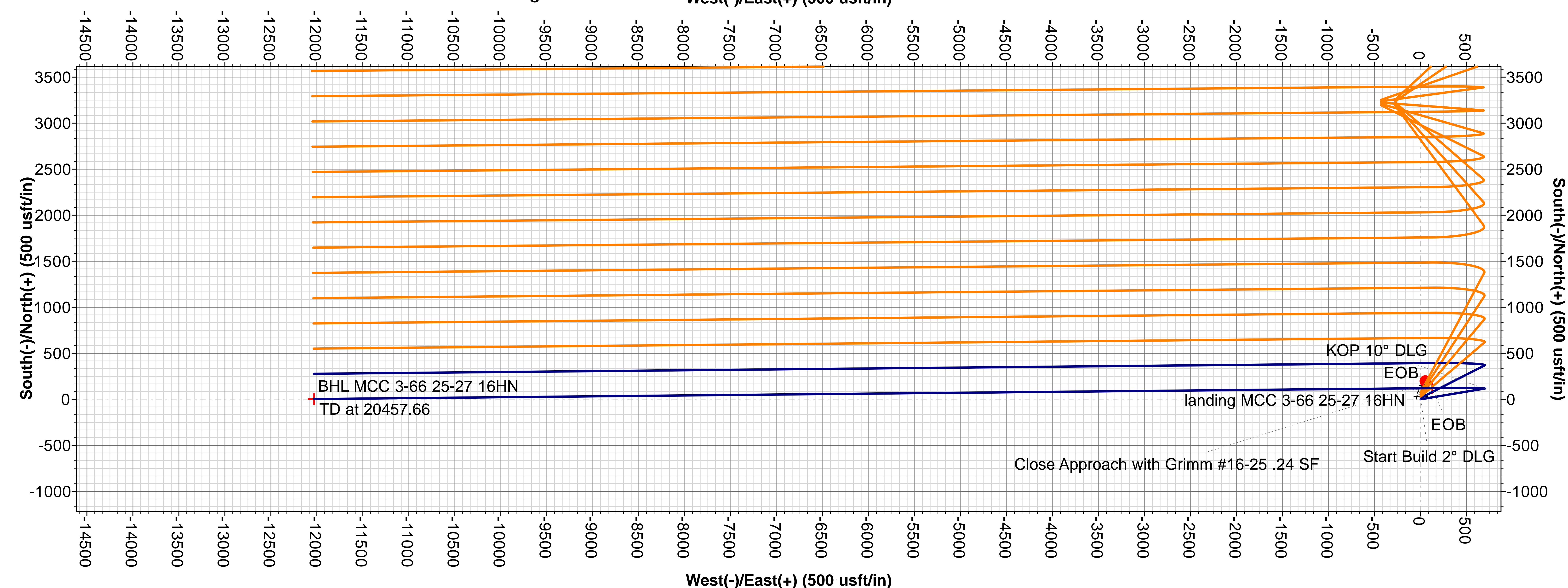
Project: Adams County Co (NAD 83)  
Site: Adams Unit ( South )  
Well: MCC 3-66 25-27 16HN  
Wellbore: MCC 3-66 25-27 16HN  
Design: MCC 3-66 25-27 16HN Wp 1.0  
Rig: West(-)/East(+) (500 usft/in)



Map System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1980  
Zone Name: Colorado Northern Zone  
5479' GL + 20' KB @ 5499.00usft  
Ground Level: 5479.00

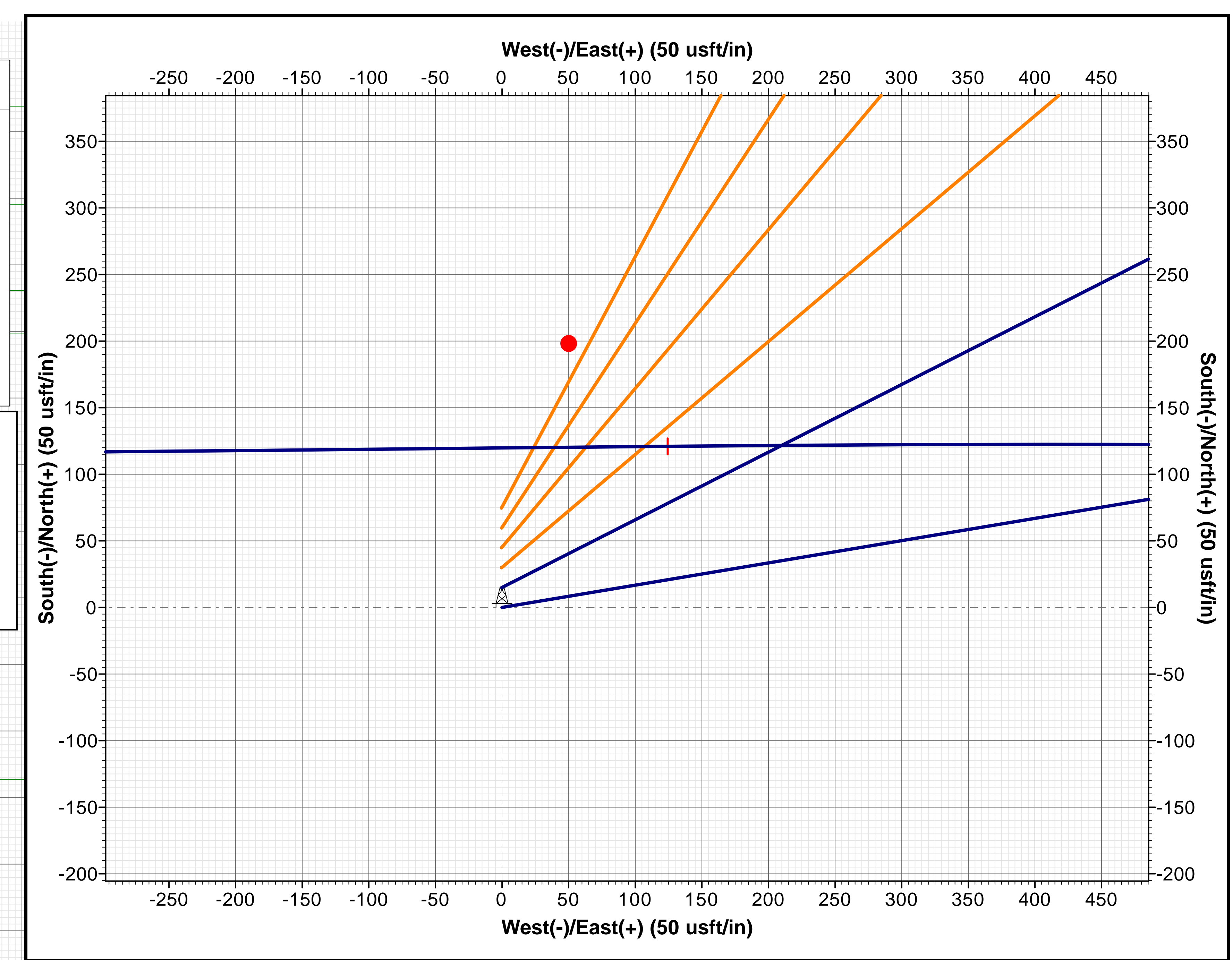


Azimuths to Grid North  
True North: -0.50°  
Magnetic North: 7.78°  
Magnetic Field  
Strength: 51996.0snT  
Dip Angle: 66.37°  
Date: 11/4/2017  
Model: BGGM2017



SECTION DETAILS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	Start Build 2° DLG
801.96	6.04	80.50	801.40	2.62	15.68	2.00	80.50	-15.68	EOB
7341.43	6.04	80.50	7304.58	116.12	694.26	0.00	0.00	-694.24	KOP 10° DLG
8301.09	90.00	269.44	7937.00	120.96	124.33	10.00	-171.01	-124.31	EOB
20457.66	90.00	269.44	7937.00	2.52	-12031.66	0.00	0.00	12031.66	TD at 20457.66

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
BHL MCC 3-66 25-27 16HN	7937.00	2.52	-12031.66	1154931.61	3207701.25	39.7562790	-104.7612480
landing MCC 3-66 25-27 16HN	7937.00	120.96	124.33	1155050.05	3219857.25	39.7563180	-104.7180100



# GMT

Adams County Co (NAD 83) Adams Unit ( South )

API#

**MCC 3-66 25-27 16HN**

8543 'MD Close Approach with Grimm #16-25 .22 SF

**MCC 3-66 25-27 16HN**

Plan: MCC 3-66 25-27 16HN Wp 1.0

Please review plan for SCC Application or Non-Mag Spacing.

Highlighted plan sections are within the Short Collar Correction (SCC) Instability Zone

## Sperry Drilling Services

### Combo Report

08 November, 2017

Well Coordinates: 39° 45' 21.56" N  
104° 43' 06.44" W

North American Datum 1983  
Colorado Northern Zone  
1,154,929.09 N  
3,219,732.92 E

Ground Level: 5,479.00 usft

Local Coordinate Origin:

Centered on Well MCC 3-66 25-27 16HN

Viewing Datum:

5479' GL + 20' KB @ 5499.00usft

TVDs to System:

N

**North Reference:**

**Grid**

Unit System:

. Two Dec (API US Survey)

Version: 5000.1 Build: 81D

Report Version: Midcon Combo v1.11

**HALLIBURTON**



## Plan Report for MCC 3-66 25-27 16HN - MCC 3-66 25-27 16HN Wp 1.0

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
0.00	0.00	0.00	-5,499.00	0.00	0.00 N	0.00 E	1,154,929.09	3,219,732.92	0.00	0.00	
100.00	0.00	0.00	-5,399.00	100.00	0.00 N	0.00 E	1,154,929.09	3,219,732.92	0.00	0.00	
200.00	0.00	0.00	-5,299.00	200.00	0.00 N	0.00 E	1,154,929.09	3,219,732.92	0.00	0.00	
300.00	0.00	0.00	-5,199.00	300.00	0.00 N	0.00 E	1,154,929.09	3,219,732.92	0.00	0.00	
309.00	0.00	0.00	-5,190.00	309.00	0.00 N	0.00 E	1,154,929.09	3,219,732.92	0.00	0.00	Denver
400.00	0.00	0.00	-5,099.00	400.00	0.00 N	0.00 E	1,154,929.09	3,219,732.92	0.00	0.00	
500.00	0.00	0.00	-4,999.00	500.00	0.00 N	0.00 E	1,154,929.09	3,219,732.92	0.00	0.00	Start Build 2° DLG
600.00	2.00	80.50	-4,899.02	599.98	0.29 N	1.72 E	1,154,929.38	3,219,734.64	2.00	-1.72	
700.00	4.00	80.50	-4,799.16	699.84	1.15 N	6.88 E	1,154,930.24	3,219,739.80	2.00	-6.88	
800.00	6.00	80.50	-4,699.55	799.45	2.59 N	15.48 E	1,154,931.68	3,219,748.40	2.00	-15.48	
801.96	6.04	80.50	-4,697.60	801.40	2.62 N	15.68 E	1,154,931.72	3,219,748.60	2.00	-15.68	EOB
900.00	6.04	80.50	-4,600.10	898.90	4.32 N	25.85 E	1,154,933.42	3,219,758.77	0.00	-25.85	
1,000.00	6.04	80.50	-4,500.66	998.34	6.06 N	36.23 E	1,154,935.15	3,219,769.15	0.00	-36.23	
1,049.94	6.04	80.50	-4,451.00	1,048.00	6.93 N	41.41 E	1,154,936.02	3,219,774.33	0.00	-41.41	Upper Arapahoe
1,100.00	6.04	80.50	-4,401.21	1,097.79	7.80 N	46.61 E	1,154,936.89	3,219,779.53	0.00	-46.61	
1,200.00	6.04	80.50	-4,301.77	1,197.23	9.53 N	56.98 E	1,154,938.62	3,219,789.90	0.00	-56.98	
1,300.00	6.04	80.50	-4,202.32	1,296.68	11.27 N	67.36 E	1,154,940.36	3,219,800.28	0.00	-67.36	
1,400.00	6.04	80.50	-4,102.88	1,396.12	13.00 N	77.74 E	1,154,942.09	3,219,810.66	0.00	-77.74	
1,500.00	6.04	80.50	-4,003.43	1,495.57	14.74 N	88.11 E	1,154,943.83	3,219,821.03	0.00	-88.11	
1,600.00	6.04	80.50	-3,903.99	1,595.01	16.47 N	98.49 E	1,154,945.57	3,219,831.41	0.00	-98.49	
1,698.53	6.04	80.50	-3,806.00	1,693.00	18.18 N	108.72 E	1,154,947.28	3,219,841.64	0.00	-108.71	Laramie - Fox Hills
1,700.00	6.04	80.50	-3,804.54	1,694.46	18.21 N	108.87 E	1,154,947.30	3,219,841.79	0.00	-108.86	
1,800.00	6.04	80.50	-3,705.10	1,793.90	19.94 N	119.24 E	1,154,949.04	3,219,852.16	0.00	-119.24	
1,900.00	6.04	80.50	-3,605.65	1,893.35	21.68 N	129.62 E	1,154,950.77	3,219,862.54	0.00	-129.62	
2,000.00	6.04	80.50	-3,506.21	1,992.79	23.42 N	140.00 E	1,154,952.51	3,219,872.92	0.00	-139.99	
2,025.35	6.04	80.50	-3,481.00	2,018.00	23.86 N	142.63 E	1,154,952.95	3,219,875.55	0.00	-142.62	Pierre Shale (Base of Fox Hills)
2,100.00	6.04	80.50	-3,406.76	2,092.24	25.15 N	150.38 E	1,154,954.24	3,219,883.29	0.00	-150.37	
2,120.00	6.04	80.50	-3,386.87	2,112.13	25.50 N	152.45 E	1,154,954.59	3,219,885.37	0.00	-152.45	9 5/8" x 12 1/4
2,200.00	6.04	80.50	-3,307.32	2,191.68	26.89 N	160.75 E	1,154,955.98	3,219,893.67	0.00	-160.75	
2,300.00	6.04	80.50	-3,207.87	2,291.13	28.62 N	171.13 E	1,154,957.72	3,219,904.05	0.00	-171.12	
2,400.00	6.04	80.50	-3,108.43	2,390.57	30.36 N	181.51 E	1,154,959.45	3,219,914.42	0.00	-181.50	
2,500.00	6.04	80.50	-3,008.98	2,490.02	32.09 N	191.88 E	1,154,961.19	3,219,924.80	0.00	-191.88	
2,600.00	6.04	80.50	-2,909.54	2,589.46	33.83 N	202.26 E	1,154,962.92	3,219,935.18	0.00	-202.25	
2,700.00	6.04	80.50	-2,810.09	2,688.91	35.57 N	212.64 E	1,154,964.66	3,219,945.55	0.00	-212.63	
2,800.00	6.04	80.50	-2,710.65	2,788.35	37.30 N	223.01 E	1,154,966.39	3,219,955.93	0.00	-223.00	
2,900.00	6.04	80.50	-2,611.20	2,887.80	39.04 N	233.39 E	1,154,968.13	3,219,966.31	0.00	-233.38	
3,000.00	6.04	80.50	-2,511.76	2,987.24	40.77 N	243.77 E	1,154,969.86	3,219,976.68	0.00	-243.76	
3,100.00	6.04	80.50	-2,412.31	3,086.69	42.51 N	254.14 E	1,154,971.60	3,219,987.06	0.00	-254.13	
3,200.00	6.04	80.50	-2,312.87	3,186.13	44.24 N	264.52 E	1,154,973.34	3,219,997.44	0.00	-264.51	
3,300.00	6.04	80.50	-2,213.42	3,285.58	45.98 N	274.90 E	1,154,975.07	3,220,007.81	0.00	-274.89	
3,400.00	6.04	80.50	-2,113.98	3,385.02	47.71 N	285.27 E	1,154,976.81	3,220,018.19	0.00	-285.26	

## Plan Report for MCC 3-66 25-27 16HN - MCC 3-66 25-27 16HN Wp 1.0

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
3,500.00	6.04	80.50	-2,014.53	3,484.47	49.45 N	295.65 E	1,154,978.54	3,220,028.57	0.00	-295.64	
3,600.00	6.04	80.50	-1,915.09	3,583.91	51.19 N	306.03 E	1,154,980.28	3,220,038.94	0.00	-306.01	
3,700.00	6.04	80.50	-1,815.64	3,683.36	52.92 N	316.40 E	1,154,982.01	3,220,049.32	0.00	-316.39	
3,800.00	6.04	80.50	-1,716.20	3,782.80	54.66 N	326.78 E	1,154,983.75	3,220,059.70	0.00	-326.77	
3,900.00	6.04	80.50	-1,616.75	3,882.25	56.39 N	337.16 E	1,154,985.48	3,220,070.07	0.00	-337.14	
4,000.00	6.04	80.50	-1,517.31	3,981.69	58.13 N	347.53 E	1,154,987.22	3,220,080.45	0.00	-347.52	
4,100.00	6.04	80.50	-1,417.86	4,081.14	59.86 N	357.91 E	1,154,988.96	3,220,090.83	0.00	-357.90	
4,200.00	6.04	80.50	-1,318.42	4,180.58	61.60 N	368.29 E	1,154,990.69	3,220,101.21	0.00	-368.27	
4,300.00	6.04	80.50	-1,218.97	4,280.03	63.33 N	378.66 E	1,154,992.43	3,220,111.58	0.00	-378.65	
4,400.00	6.04	80.50	-1,119.53	4,379.47	65.07 N	389.04 E	1,154,994.16	3,220,121.96	0.00	-389.03	
4,500.00	6.04	80.50	-1,020.08	4,478.92	66.81 N	399.42 E	1,154,995.90	3,220,132.34	0.00	-399.40	
4,600.00	6.04	80.50	-920.64	4,578.36	68.54 N	409.79 E	1,154,997.63	3,220,142.71	0.00	-409.78	
4,700.00	6.04	80.50	-821.19	4,677.81	70.28 N	420.17 E	1,154,999.37	3,220,153.09	0.00	-420.15	
4,800.00	6.04	80.50	-721.75	4,777.25	72.01 N	430.55 E	1,155,001.10	3,220,163.47	0.00	-430.53	
4,900.00	6.04	80.50	-622.30	4,876.70	73.75 N	440.92 E	1,155,002.84	3,220,173.84	0.00	-440.91	
5,000.00	6.04	80.50	-522.86	4,976.14	75.48 N	451.30 E	1,155,004.58	3,220,184.22	0.00	-451.28	
5,100.00	6.04	80.50	-423.41	5,075.59	77.22 N	461.68 E	1,155,006.31	3,220,194.60	0.00	-461.66	
5,200.00	6.04	80.50	-323.97	5,175.03	78.95 N	472.05 E	1,155,008.05	3,220,204.97	0.00	-472.04	
5,300.00	6.04	80.50	-224.52	5,274.48	80.69 N	482.43 E	1,155,009.78	3,220,215.35	0.00	-482.41	
5,389.02	6.04	80.50	-136.00	5,363.00	82.24 N	491.67 E	1,155,011.33	3,220,224.59	0.00	-491.65	Shannon Sandstone
5,400.00	6.04	80.50	-125.08	5,373.92	82.43 N	492.81 E	1,155,011.52	3,220,225.73	0.00	-492.79	
5,500.00	6.04	80.50	-25.63	5,473.37	84.16 N	503.18 E	1,155,013.25	3,220,236.10	0.00	-503.17	
5,600.00	6.04	80.50	73.81	5,572.81	85.90 N	513.56 E	1,155,014.99	3,220,246.48	0.00	-513.54	
5,700.00	6.04	80.50	173.26	5,672.26	87.63 N	523.94 E	1,155,016.73	3,220,256.86	0.00	-523.92	
5,800.00	6.04	80.50	272.70	5,771.70	89.37 N	534.31 E	1,155,018.46	3,220,267.23	0.00	-534.29	
5,900.00	6.04	80.50	372.15	5,871.15	91.10 N	544.69 E	1,155,020.20	3,220,277.61	0.00	-544.67	
6,000.00	6.04	80.50	471.59	5,970.59	92.84 N	555.07 E	1,155,021.93	3,220,287.99	0.00	-555.05	
6,100.00	6.04	80.50	571.04	6,070.04	94.58 N	565.44 E	1,155,023.67	3,220,298.36	0.00	-565.42	
6,200.00	6.04	80.50	670.48	6,169.48	96.31 N	575.82 E	1,155,025.40	3,220,308.74	0.00	-575.80	
6,300.00	6.04	80.50	769.93	6,268.93	98.05 N	586.20 E	1,155,027.14	3,220,319.12	0.00	-586.18	
6,400.00	6.04	80.50	869.37	6,368.37	99.78 N	596.57 E	1,155,028.87	3,220,329.49	0.00	-596.55	
6,500.00	6.04	80.50	968.82	6,467.82	101.52 N	606.95 E	1,155,030.61	3,220,339.87	0.00	-606.93	
6,600.00	6.04	80.50	1,068.26	6,567.26	103.25 N	617.33 E	1,155,032.35	3,220,350.25	0.00	-617.31	
6,700.00	6.04	80.50	1,167.71	6,666.71	104.99 N	627.70 E	1,155,034.08	3,220,360.62	0.00	-627.68	
6,800.00	6.04	80.50	1,267.15	6,766.15	106.72 N	638.08 E	1,155,035.82	3,220,371.00	0.00	-638.06	
6,900.00	6.04	80.50	1,366.60	6,865.60	108.46 N	648.46 E	1,155,037.55	3,220,381.38	0.00	-648.43	
7,000.00	6.04	80.50	1,466.04	6,965.04	110.20 N	658.83 E	1,155,039.29	3,220,391.75	0.00	-658.81	
7,100.00	6.04	80.50	1,565.49	7,064.49	111.93 N	669.21 E	1,155,041.02	3,220,402.13	0.00	-669.19	
7,200.00	6.04	80.50	1,664.93	7,163.93	113.67 N	679.59 E	1,155,042.76	3,220,412.51	0.00	-679.56	
7,300.00	6.04	80.50	1,764.38	7,263.38	115.40 N	689.96 E	1,155,044.49	3,220,422.88	0.00	-689.94	
7,341.43	6.04	80.50	1,805.58	7,304.58	116.12 N	694.26 E	1,155,045.21	3,220,427.18	0.00	-694.24	KOP 10° DLG

## Plan Report for MCC 3-66 25-27 16HN - MCC 3-66 25-27 16HN Wp 1.0

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
7,400.00	0.95	6.03	1,864.03	7,363.03	117.11 N	697.36 E	1,155,046.20	3,220,430.27	10.00	-697.33	
7,500.00	9.94	274.83	1,963.53	7,462.53	118.66 N	688.82 E	1,155,047.76	3,220,421.74	10.00	-688.80	
7,600.00	19.91	272.04	2,060.03	7,559.03	120.00 N	663.14 E	1,155,049.09	3,220,396.06	10.00	-663.12	
7,700.00	29.90	271.08	2,150.62	7,649.62	121.08 N	621.09 E	1,155,050.17	3,220,354.01	10.00	-621.07	
7,732.12	33.12	270.89	2,178.00	7,677.00	121.37 N	604.31 E	1,155,050.46	3,220,337.23	10.00	-604.29	Sharon Springs Shale
7,800.00	39.90	270.57	2,232.53	7,731.53	121.87 N	563.95 E	1,155,050.96	3,220,296.87	10.00	-563.93	
7,817.80	41.68	270.50	2,246.00	7,745.00	121.98 N	552.33 E	1,155,051.07	3,220,285.25	10.00	-552.30	Niobrara
7,839.59	43.86	270.42	2,262.00	7,761.00	122.10 N	537.53 E	1,155,051.19	3,220,270.45	10.00	-537.50	Niobrara A
7,900.00	49.90	270.23	2,303.27	7,802.27	122.34 N	493.46 E	1,155,051.44	3,220,226.38	10.00	-493.43	
7,945.21	54.42	270.12	2,331.00	7,830.00	122.45 N	457.77 E	1,155,051.55	3,220,190.69	10.00	-457.74	Niobrara B Top
8,000.00	59.90	269.99	2,360.70	7,859.70	122.49 N	411.75 E	1,155,051.58	3,220,144.67	10.00	-411.73	
8,100.00	69.89	269.79	2,403.08	7,902.08	122.31 N	321.31 E	1,155,051.40	3,220,054.23	10.00	-321.29	
8,131.20	73.01	269.73	2,413.00	7,912.00	122.18 N	291.74 E	1,155,051.28	3,220,024.66	10.00	-291.72	Niobrara C Top
8,200.00	79.89	269.61	2,429.11	7,928.11	121.80 N	224.89 E	1,155,050.89	3,219,957.81	10.00	-224.87	
8,300.00	89.89	269.44	2,438.00	7,937.00	120.97 N	125.42 E	1,155,050.07	3,219,858.34	10.00	-125.40	
8,301.09	90.00	269.44	2,438.00	7,937.00	120.96 N	124.33 E	1,155,050.05	3,219,857.25	10.00	-124.31	EOB - landing MCC 3-66 25-27 16HN
8,400.00	90.00	269.44	2,438.00	7,937.00	120.00 N	25.43 E	1,155,049.09	3,219,758.34	0.00	-25.40	
8,500.00	90.00	269.44	2,438.00	7,937.00	119.02 N	74.57 W	1,155,048.12	3,219,658.35	0.00	74.59	
8,543.00	90.00	269.44	2,438.00	7,937.00	118.61 N	117.57 W	1,155,047.70	3,219,615.35	0.00	117.59	Close Approach with Grimm #16-25 .24 SF
8,600.00	90.00	269.44	2,438.00	7,937.00	118.05 N	174.57 W	1,155,047.14	3,219,558.35	0.00	174.59	
8,700.00	90.00	269.44	2,438.00	7,937.00	117.08 N	274.56 W	1,155,046.17	3,219,458.36	0.00	274.58	
8,800.00	90.00	269.44	2,438.00	7,937.00	116.10 N	374.56 W	1,155,045.19	3,219,358.36	0.00	374.58	
8,900.00	90.00	269.44	2,438.00	7,937.00	115.13 N	474.55 W	1,155,044.22	3,219,258.37	0.00	474.57	
9,000.00	90.00	269.44	2,438.00	7,937.00	114.15 N	574.55 W	1,155,043.25	3,219,158.37	0.00	574.57	
9,100.00	90.00	269.44	2,438.00	7,937.00	113.18 N	674.54 W	1,155,042.27	3,219,058.38	0.00	674.56	
9,200.00	90.00	269.44	2,438.00	7,937.00	112.20 N	774.54 W	1,155,041.30	3,218,958.38	0.00	774.56	
9,300.00	90.00	269.44	2,438.00	7,937.00	111.23 N	874.53 W	1,155,040.32	3,218,858.39	0.00	874.56	
9,400.00	90.00	269.44	2,438.00	7,937.00	110.26 N	974.53 W	1,155,039.35	3,218,758.39	0.00	974.55	
9,500.00	90.00	269.44	2,438.00	7,937.00	109.28 N	1,074.52 W	1,155,038.37	3,218,658.40	0.00	1,074.55	
9,600.00	90.00	269.44	2,438.00	7,937.00	108.31 N	1,174.52 W	1,155,037.40	3,218,558.40	0.00	1,174.54	
9,700.00	90.00	269.44	2,438.00	7,937.00	107.33 N	1,274.51 W	1,155,036.42	3,218,458.41	0.00	1,274.54	
9,800.00	90.00	269.44	2,438.00	7,937.00	106.36 N	1,374.51 W	1,155,035.45	3,218,358.41	0.00	1,374.53	
9,900.00	90.00	269.44	2,438.00	7,937.00	105.38 N	1,474.50 W	1,155,034.48	3,218,258.42	0.00	1,474.53	
10,000.00	90.00	269.44	2,438.00	7,937.00	104.41 N	1,574.50 W	1,155,033.50	3,218,158.42	0.00	1,574.52	
10,100.00	90.00	269.44	2,438.00	7,937.00	103.44 N	1,674.49 W	1,155,032.53	3,218,058.43	0.00	1,674.52	
10,200.00	90.00	269.44	2,438.00	7,937.00	102.46 N	1,774.49 W	1,155,031.55	3,217,958.43	0.00	1,774.51	
10,300.00	90.00	269.44	2,438.00	7,937.00	101.49 N	1,874.48 W	1,155,030.58	3,217,858.43	0.00	1,874.51	
10,400.00	90.00	269.44	2,438.00	7,937.00	100.51 N	1,974.48 W	1,155,029.60	3,217,758.44	0.00	1,974.50	
10,500.00	90.00	269.44	2,438.00	7,937.00	99.54 N	2,074.47 W	1,155,028.63	3,217,658.44	0.00	2,074.50	
10,600.00	90.00	269.44	2,438.00	7,937.00	98.56 N	2,174.47 W	1,155,027.66	3,217,558.45	0.00	2,174.49	
10,700.00	90.00	269.44	2,438.00	7,937.00	97.59 N	2,274.47 W	1,155,026.68	3,217,458.45	0.00	2,274.49	

## Plan Report for MCC 3-66 25-27 16HN - MCC 3-66 25-27 16HN Wp 1.0

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
10,800.00	90.00	269.44	2,438.00	7,937.00	96.61 N	2,374.46 W	1,155,025.71	3,217,358.46	0.00	2,374.48	
10,900.00	90.00	269.44	2,438.00	7,937.00	95.64 N	2,474.46 W	1,155,024.73	3,217,258.46	0.00	2,474.48	
11,000.00	90.00	269.44	2,438.00	7,937.00	94.67 N	2,574.45 W	1,155,023.76	3,217,158.47	0.00	2,574.47	
11,100.00	90.00	269.44	2,438.00	7,937.00	93.69 N	2,674.45 W	1,155,022.78	3,217,058.47	0.00	2,674.47	
11,200.00	90.00	269.44	2,438.00	7,937.00	92.72 N	2,774.44 W	1,155,021.81	3,216,958.48	0.00	2,774.46	
11,300.00	90.00	269.44	2,438.00	7,937.00	91.74 N	2,874.44 W	1,155,020.84	3,216,858.48	0.00	2,874.46	
11,400.00	90.00	269.44	2,438.00	7,937.00	90.77 N	2,974.43 W	1,155,019.86	3,216,758.49	0.00	2,974.45	
11,500.00	90.00	269.44	2,438.00	7,937.00	89.79 N	3,074.43 W	1,155,018.89	3,216,658.49	0.00	3,074.45	
11,600.00	90.00	269.44	2,438.00	7,937.00	88.82 N	3,174.42 W	1,155,017.91	3,216,558.50	0.00	3,174.44	
11,700.00	90.00	269.44	2,438.00	7,937.00	87.85 N	3,274.42 W	1,155,016.94	3,216,458.50	0.00	3,274.44	
11,800.00	90.00	269.44	2,438.00	7,937.00	86.87 N	3,374.41 W	1,155,015.96	3,216,358.51	0.00	3,374.43	
11,900.00	90.00	269.44	2,438.00	7,937.00	85.90 N	3,474.41 W	1,155,014.99	3,216,258.51	0.00	3,474.43	
12,000.00	90.00	269.44	2,438.00	7,937.00	84.92 N	3,574.40 W	1,155,014.02	3,216,158.52	0.00	3,574.42	
12,100.00	90.00	269.44	2,438.00	7,937.00	83.95 N	3,674.40 W	1,155,013.04	3,216,058.52	0.00	3,674.42	
12,200.00	90.00	269.44	2,438.00	7,937.00	82.97 N	3,774.39 W	1,155,012.07	3,215,958.52	0.00	3,774.41	
12,300.00	90.00	269.44	2,438.00	7,937.00	82.00 N	3,874.39 W	1,155,011.09	3,215,858.53	0.00	3,874.41	
12,400.00	90.00	269.44	2,438.00	7,937.00	81.03 N	3,974.38 W	1,155,010.12	3,215,758.53	0.00	3,974.40	
12,500.00	90.00	269.44	2,438.00	7,937.00	80.05 N	4,074.38 W	1,155,009.14	3,215,658.54	0.00	4,074.40	
12,600.00	90.00	269.44	2,438.00	7,937.00	79.08 N	4,174.38 W	1,155,008.17	3,215,558.54	0.00	4,174.39	
12,700.00	90.00	269.44	2,438.00	7,937.00	78.10 N	4,274.37 W	1,155,007.19	3,215,458.55	0.00	4,274.39	
12,800.00	90.00	269.44	2,438.00	7,937.00	77.13 N	4,374.37 W	1,155,006.22	3,215,358.55	0.00	4,374.38	
12,900.00	90.00	269.44	2,438.00	7,937.00	76.15 N	4,474.36 W	1,155,005.25	3,215,258.56	0.00	4,474.38	
13,000.00	90.00	269.44	2,438.00	7,937.00	75.18 N	4,574.36 W	1,155,004.27	3,215,158.56	0.00	4,574.37	
13,100.00	90.00	269.44	2,438.00	7,937.00	74.21 N	4,674.35 W	1,155,003.30	3,215,058.57	0.00	4,674.37	
13,200.00	90.00	269.44	2,438.00	7,937.00	73.23 N	4,774.35 W	1,155,002.32	3,214,958.57	0.00	4,774.36	
13,300.00	90.00	269.44	2,438.00	7,937.00	72.26 N	4,874.34 W	1,155,001.35	3,214,858.58	0.00	4,874.36	
13,400.00	90.00	269.44	2,438.00	7,937.00	71.28 N	4,974.34 W	1,155,000.37	3,214,758.58	0.00	4,974.35	
13,500.00	90.00	269.44	2,438.00	7,937.00	70.31 N	5,074.33 W	1,154,999.40	3,214,658.59	0.00	5,074.35	
13,600.00	90.00	269.44	2,438.00	7,937.00	69.33 N	5,174.33 W	1,154,998.43	3,214,558.59	0.00	5,174.34	
13,700.00	90.00	269.44	2,438.00	7,937.00	68.36 N	5,274.32 W	1,154,997.45	3,214,458.60	0.00	5,274.34	
13,800.00	90.00	269.44	2,438.00	7,937.00	67.38 N	5,374.32 W	1,154,996.48	3,214,358.60	0.00	5,374.33	
13,900.00	90.00	269.44	2,438.00	7,937.00	66.41 N	5,474.31 W	1,154,995.50	3,214,258.61	0.00	5,474.33	
14,000.00	90.00	269.44	2,438.00	7,937.00	65.44 N	5,574.31 W	1,154,994.53	3,214,158.61	0.00	5,574.32	
14,100.00	90.00	269.44	2,438.00	7,937.00	64.46 N	5,674.30 W	1,154,993.55	3,214,058.62	0.00	5,674.32	
14,200.00	90.00	269.44	2,438.00	7,937.00	63.49 N	5,774.30 W	1,154,992.58	3,213,958.62	0.00	5,774.31	
14,300.00	90.00	269.44	2,438.00	7,937.00	62.51 N	5,874.29 W	1,154,991.61	3,213,858.62	0.00	5,874.31	
14,400.00	90.00	269.44	2,438.00	7,937.00	61.54 N	5,974.29 W	1,154,990.63	3,213,758.63	0.00	5,974.30	
14,500.00	90.00	269.44	2,438.00	7,937.00	60.56 N	6,074.29 W	1,154,989.66	3,213,658.63	0.00	6,074.30	
14,600.00	90.00	269.44	2,438.00	7,937.00	59.59 N	6,174.28 W	1,154,988.68	3,213,558.64	0.00	6,174.29	
14,700.00	90.00	269.44	2,438.00	7,937.00	58.62 N	6,274.28 W	1,154,987.71	3,213,458.64	0.00	6,274.29	
14,800.00	90.00	269.44	2,438.00	7,937.00	57.64 N	6,374.27 W	1,154,986.73	3,213,358.65	0.00	6,374.28	

## Plan Report for MCC 3-66 25-27 16HN - MCC 3-66 25-27 16HN Wp 1.0

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
14,900.00	90.00	269.44	2,438.00	7,937.00	56.67 N	6,474.27 W	1,154,985.76	3,213,258.65	0.00	6,474.28	
15,000.00	90.00	269.44	2,438.00	7,937.00	55.69 N	6,574.26 W	1,154,984.79	3,213,158.66	0.00	6,574.27	
15,100.00	90.00	269.44	2,438.00	7,937.00	54.72 N	6,674.26 W	1,154,983.81	3,213,058.66	0.00	6,674.27	
15,200.00	90.00	269.44	2,438.00	7,937.00	53.74 N	6,774.25 W	1,154,982.84	3,212,958.67	0.00	6,774.26	
15,300.00	90.00	269.44	2,438.00	7,937.00	52.77 N	6,874.25 W	1,154,981.86	3,212,858.67	0.00	6,874.26	
15,400.00	90.00	269.44	2,438.00	7,937.00	51.80 N	6,974.24 W	1,154,980.89	3,212,758.68	0.00	6,974.25	
15,500.00	90.00	269.44	2,438.00	7,937.00	50.82 N	7,074.24 W	1,154,979.91	3,212,658.68	0.00	7,074.25	
15,600.00	90.00	269.44	2,438.00	7,937.00	49.85 N	7,174.23 W	1,154,978.94	3,212,558.69	0.00	7,174.24	
15,700.00	90.00	269.44	2,438.00	7,937.00	48.87 N	7,274.23 W	1,154,977.97	3,212,458.69	0.00	7,274.24	
15,800.00	90.00	269.44	2,438.00	7,937.00	47.90 N	7,374.22 W	1,154,976.99	3,212,358.70	0.00	7,374.23	
15,900.00	90.00	269.44	2,438.00	7,937.00	46.92 N	7,474.22 W	1,154,976.02	3,212,258.70	0.00	7,474.23	
16,000.00	90.00	269.44	2,438.00	7,937.00	45.95 N	7,574.21 W	1,154,975.04	3,212,158.71	0.00	7,574.22	
16,100.00	90.00	269.44	2,438.00	7,937.00	44.98 N	7,674.21 W	1,154,974.07	3,212,058.71	0.00	7,674.22	
16,200.00	90.00	269.44	2,438.00	7,937.00	44.00 N	7,774.20 W	1,154,973.09	3,211,958.71	0.00	7,774.21	
16,300.00	90.00	269.44	2,438.00	7,937.00	43.03 N	7,874.20 W	1,154,972.12	3,211,858.72	0.00	7,874.21	
16,400.00	90.00	269.44	2,438.00	7,937.00	42.05 N	7,974.19 W	1,154,971.14	3,211,758.72	0.00	7,974.20	
16,500.00	90.00	269.44	2,438.00	7,937.00	41.08 N	8,074.19 W	1,154,970.17	3,211,658.73	0.00	8,074.20	
16,600.00	90.00	269.44	2,438.00	7,937.00	40.10 N	8,174.19 W	1,154,969.20	3,211,558.73	0.00	8,174.19	
16,700.00	90.00	269.44	2,438.00	7,937.00	39.13 N	8,274.18 W	1,154,968.22	3,211,458.74	0.00	8,274.19	
16,800.00	90.00	269.44	2,438.00	7,937.00	38.15 N	8,374.18 W	1,154,967.25	3,211,358.74	0.00	8,374.18	
16,900.00	90.00	269.44	2,438.00	7,937.00	37.18 N	8,474.17 W	1,154,966.27	3,211,258.75	0.00	8,474.18	
17,000.00	90.00	269.44	2,438.00	7,937.00	36.21 N	8,574.17 W	1,154,965.30	3,211,158.75	0.00	8,574.17	
17,100.00	90.00	269.44	2,438.00	7,937.00	35.23 N	8,674.16 W	1,154,964.32	3,211,058.76	0.00	8,674.17	
17,200.00	90.00	269.44	2,438.00	7,937.00	34.26 N	8,774.16 W	1,154,963.35	3,210,958.76	0.00	8,774.16	
17,300.00	90.00	269.44	2,438.00	7,937.00	33.28 N	8,874.15 W	1,154,962.38	3,210,858.77	0.00	8,874.16	
17,400.00	90.00	269.44	2,438.00	7,937.00	32.31 N	8,974.15 W	1,154,961.40	3,210,758.77	0.00	8,974.15	
17,500.00	90.00	269.44	2,438.00	7,937.00	31.33 N	9,074.14 W	1,154,960.43	3,210,658.78	0.00	9,074.15	
17,600.00	90.00	269.44	2,438.00	7,937.00	30.36 N	9,174.14 W	1,154,959.45	3,210,558.78	0.00	9,174.14	
17,700.00	90.00	269.44	2,438.00	7,937.00	29.39 N	9,274.13 W	1,154,958.48	3,210,458.79	0.00	9,274.14	
17,800.00	90.00	269.44	2,438.00	7,937.00	28.41 N	9,374.13 W	1,154,957.50	3,210,358.79	0.00	9,374.13	
17,900.00	90.00	269.44	2,438.00	7,937.00	27.44 N	9,474.12 W	1,154,956.53	3,210,258.80	0.00	9,474.13	
18,000.00	90.00	269.44	2,438.00	7,937.00	26.46 N	9,574.12 W	1,154,955.56	3,210,158.80	0.00	9,574.12	
18,100.00	90.00	269.44	2,438.00	7,937.00	25.49 N	9,674.11 W	1,154,954.58	3,210,058.81	0.00	9,674.12	
18,200.00	90.00	269.44	2,438.00	7,937.00	24.51 N	9,774.11 W	1,154,953.61	3,209,958.81	0.00	9,774.11	
18,300.00	90.00	269.44	2,438.00	7,937.00	23.54 N	9,874.10 W	1,154,952.63	3,209,858.81	0.00	9,874.11	
18,400.00	90.00	269.44	2,438.00	7,937.00	22.57 N	9,974.10 W	1,154,951.66	3,209,758.82	0.00	9,974.10	
18,500.00	90.00	269.44	2,438.00	7,937.00	21.59 N	10,074.10 W	1,154,950.68	3,209,658.82	0.00	10,074.10	
18,600.00	90.00	269.44	2,438.00	7,937.00	20.62 N	10,174.09 W	1,154,949.71	3,209,558.83	0.00	10,174.09	
18,700.00	90.00	269.44	2,438.00	7,937.00	19.64 N	10,274.09 W	1,154,948.74	3,209,458.83	0.00	10,274.09	
18,800.00	90.00	269.44	2,438.00	7,937.00	18.67 N	10,374.08 W	1,154,947.76	3,209,358.84	0.00	10,374.08	
18,900.00	90.00	269.44	2,438.00	7,937.00	17.69 N	10,474.08 W	1,154,946.79	3,209,258.84	0.00	10,474.08	

## Plan Report for MCC 3-66 25-27 16HN - MCC 3-66 25-27 16HN Wp 1.0

Measured Depth (usft)	Inclination (°)	Grid Azimuth (°)	TVD below System (usft)	Vertical Depth (usft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (usft)	Comments
					Northing (usft)	Easting (usft)	Northing (usft)	Easting (usft)			
19,000.00	90.00	269.44	2,438.00	7,937.00	16.72 N	10,574.07 W	1,154,945.81	3,209,158.85	0.00	10,574.07	
19,100.00	90.00	269.44	2,438.00	7,937.00	15.75 N	10,674.07 W	1,154,944.84	3,209,058.85	0.00	10,674.07	
19,200.00	90.00	269.44	2,438.00	7,937.00	14.77 N	10,774.06 W	1,154,943.86	3,208,958.86	0.00	10,774.06	
19,300.00	90.00	269.44	2,438.00	7,937.00	13.80 N	10,874.06 W	1,154,942.89	3,208,858.86	0.00	10,874.06	
19,400.00	90.00	269.44	2,438.00	7,937.00	12.82 N	10,974.05 W	1,154,941.91	3,208,758.87	0.00	10,974.05	
19,500.00	90.00	269.44	2,438.00	7,937.00	11.85 N	11,074.05 W	1,154,940.94	3,208,658.87	0.00	11,074.05	
19,600.00	90.00	269.44	2,438.00	7,937.00	10.87 N	11,174.04 W	1,154,939.97	3,208,558.88	0.00	11,174.04	
19,700.00	90.00	269.44	2,438.00	7,937.00	9.90 N	11,274.04 W	1,154,938.99	3,208,458.88	0.00	11,274.04	
19,800.00	90.00	269.44	2,438.00	7,937.00	8.93 N	11,374.03 W	1,154,938.02	3,208,358.89	0.00	11,374.04	
19,900.00	90.00	269.44	2,438.00	7,937.00	7.95 N	11,474.03 W	1,154,937.04	3,208,258.89	0.00	11,474.03	
20,000.00	90.00	269.44	2,438.00	7,937.00	6.98 N	11,574.02 W	1,154,936.07	3,208,158.90	0.00	11,574.03	
20,100.00	90.00	269.44	2,438.00	7,937.00	6.00 N	11,674.02 W	1,154,935.09	3,208,058.90	0.00	11,674.02	
20,200.00	90.00	269.44	2,438.00	7,937.00	5.03 N	11,774.01 W	1,154,934.12	3,207,958.90	0.00	11,774.02	
20,300.00	90.00	269.44	2,438.00	7,937.00	4.05 N	11,874.01 W	1,154,933.15	3,207,858.91	0.00	11,874.01	
20,400.00	90.00	269.44	2,438.00	7,937.00	3.08 N	11,974.00 W	1,154,932.17	3,207,758.91	0.00	11,974.01	
20,457.66	90.00	269.44	2,438.00	7,937.00	2.52 N	12,031.66 W	1,154,931.61	3,207,701.26	0.00	12,031.66	TD at 20457.66 - BHL MCC 3-66 25-27 16HN

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.00	500.00	0.00	0.00	Start Build 2° DLG
801.96	801.40	2.62	15.68	EOB
7,341.43	7,304.58	116.12	694.26	KOP 10° DLG
8,301.09	7,937.00	120.96	124.33	EOB
8,543.00	7,937.00	118.61	-117.57	Close Approach with Grimm #16-25 .24 SF
20,457.66	7,937.00	2.52	-12,031.66	TD at 20457.66

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
TD	No Target (Freehand)	270.01	Slot	0.00	0.00	0.00



## Plan Report for MCC 3-66 25-27 16HN - MCC 3-66 25-27 16HN Wp 1.0

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	8,301.00	MCC 3-66 25-27 16HN Wp 1.0	2_MWD
8,301.00	20,457.66	MCC 3-66 25-27 16HN Wp 1.0	2_MWD+IFR1+MS

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,120.00	2,112.13	9 5/8" x 12 1/4	9-5/8	12-1/4
20,457.66	7,937.00	5 1/2" x 8 1/2"	5-1/2	8-1/2

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	TVDSS (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
309.00	309.00	-5,190.00	Denver			
1,049.94	1,048.00	-4,451.00	Upper Arapahoe			
1,698.53	1,693.00	-3,806.00	Laramie - Fox Hills			
2,025.35	2,018.00	-3,481.00	Pierre Shale (Base of Fox Hills)			
5,389.02	5,363.00	-136.00	Shannon Sandstone			
7,732.12	7,677.00	2,178.00	Sharon Springs Shale			
7,817.80	7,745.00	2,246.00	Niobrara			
7,839.59	7,761.00	2,262.00	Niobrara A			
7,945.21	7,830.00	2,331.00	Niobrara B Top			
8,131.20	7,912.00	2,413.00	Niobrara C Top			

## Plan Report for MCC 3-66 25-27 16HN - MCC 3-66 25-27 16HN Wp 1.0

**Design 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
BHL MCC 3-66 25-27 16HN ()	0.00	0.00	7,937.00	2.52	-12,031.66	1,154,931.61	3,207,701.25	39.7562790	-104.7612480
- plan hits target center									
- Point									
landing MCC 3-66 25-27 16HN ()	0.00	0.00	7,937.00	120.96	124.33	1,155,050.05	3,219,857.25	39.7563180	-104.7180100
- plan hits target center									
- Point									

**Directional Difficulty Index**

Average Dogleg over Survey:	0.50 °/100usft	Maximum Dogleg over Survey:	10.00 °/100usft at 8,301.09 usft
Net Tortousity applicable to Plans:	0.50 °/100usft	Directional Difficulty Index:	6.836

**Audit Info**

**North Reference Sheet for Adams Unit ( South ) - MCC 3-66 25-27 16HN - MCC 3-66 25-27 16HN**

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

Vertical Depths are relative to 5479' GL + 20' KB @ 5499.00usft. Northing and Easting are relative to MCC 3-66 25-27 16HN

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 -105.5000000°, Longitude Origin:0.0000000°, Latitude Origin:40.7833333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99999389

Grid Coordinates of Well: 1,154,929.09 usft N, 3,219,732.92 usft E

Geographical Coordinates of Well: 39° 45' 21.56" N, 104° 43' 06.44" W

Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 20,457.66usft  
the Bottom Hole Displacement is 12,031.66usft in the Direction of 270.01° (Grid).

Magnetic Convergence at surface is: -7.78° ( 4 November 2017, , BGGM2017)

