

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T2N-R66W

Kunzman 29N-5HZ

Plan D 0

Plan: Plan D 0-Permit

Sperry Drilling Services

Proposal Report

05 June, 2013

Well Coordinates: 1,301,807.50 N, 3,194,525.32 E (40° 09' 35.14" N, 104° 48' 14.44" W)

Ground Level: 4,858.00 ft

Local Coordinate Origin:

Centered on Well Kunzman 29N-5HZ

Viewing Datum:

RKB @ 17' @ 4875.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 431

HALLIBURTON

Project: Weld County, CO (NAD 83)
 Site: Sec. 8-T2N-R66W
 Well: Kunzman 29N-5HZ
 Wellbore: Plan D 0
 Design: Plan D 0-Permit



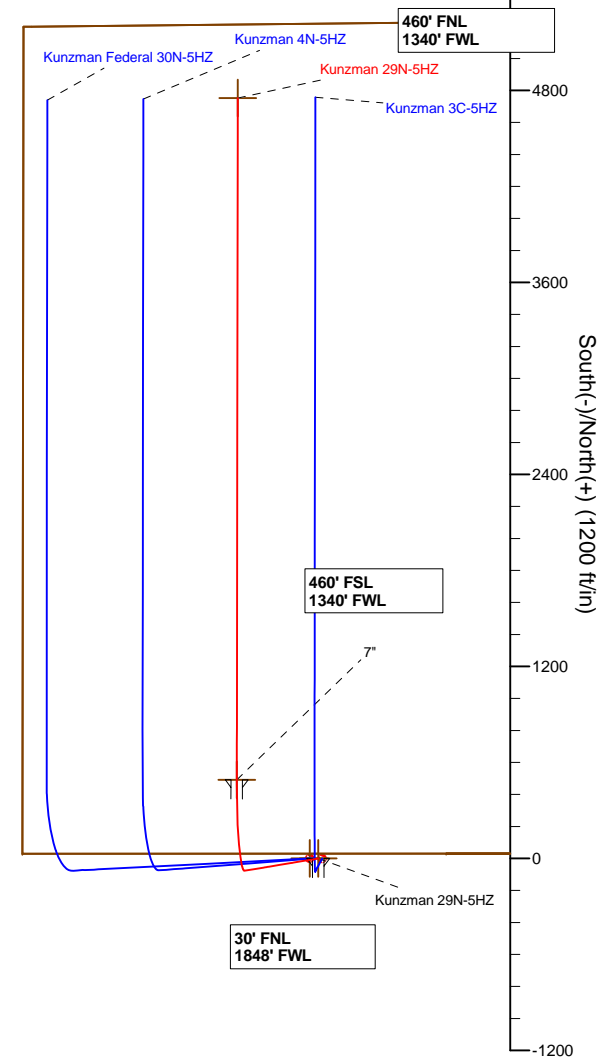
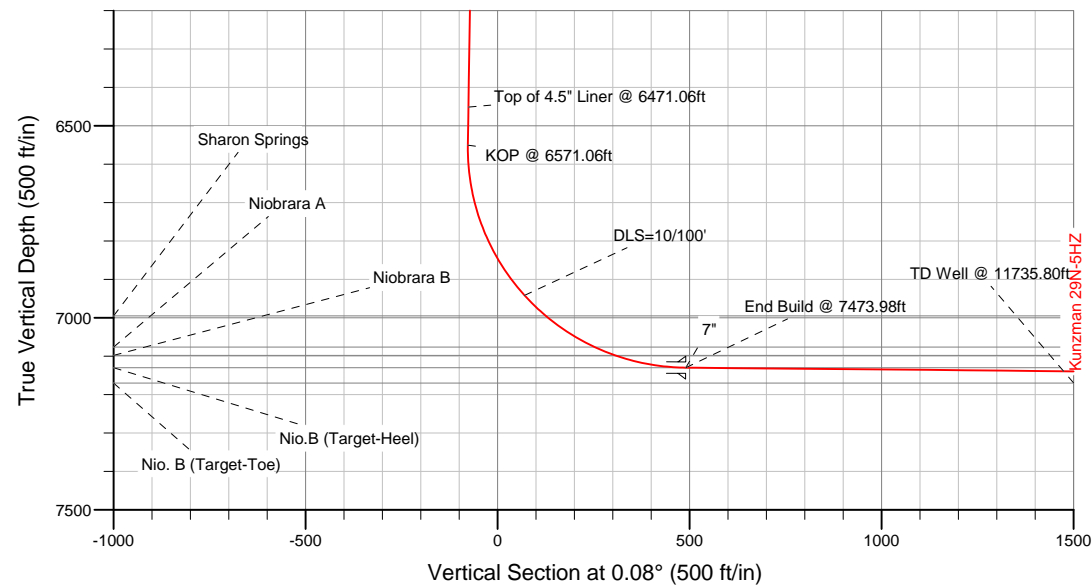
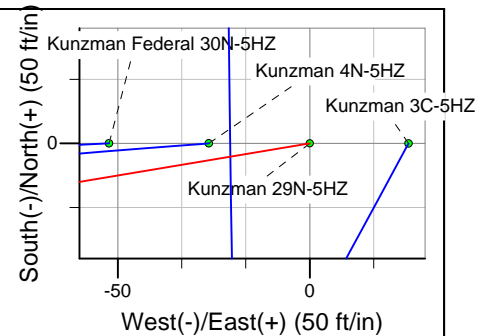
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	
3	1349.84	5.00	260.53	1349.52	-1.79	-10.74	2.00	260.53	-1.81	
4	6571.06	5.00	260.53	6550.90	-76.60	-459.31	0.00	0.00	-77.24	
5	7473.98	89.46	0.08	7130.00	491.01	-508.00	10.00	99.56	490.30	Kunzman 29N-5HZ_CP
6	11735.80	89.46	0.08	7170.00	4752.64	-502.18	0.00	0.00	4751.94	Kunzman 29N-5HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Kunzman 29N-5HZ_SHL	0.00	0.01	0.00	40.159761	-104.804010	Point
Kunzman_SEC	0.00	0.02	-52.27	40.159761	-104.804197	Polygon
Kunzman 29N-5HZ_CP	7130.00	491.01	-508.00	40.161109	-104.805828	Point
Kunzman 29N-5HZ_BHL	7170.00	4752.64	-502.18	40.172807	-104.805807	Point

MD	TVD	
6471.06	6451.28	Top of 4.5" Liner @ 6471.06ft
6571.06	6550.90	KOP @ 6571.06ft



WELL DETAILS: Kunzman 29N-5HZ

Ground Level: 4858.00
 RKB @ 17' @ 4875.00ft (Drilling Rig)

Plan: Plan D 0-Permit (Kunzman 29N-5HZ/Plan D 0)

Created By: Fred Hartmann Date: 06/05/2013

Plan Report for Kunzman 29N-5HZ - Plan D 0-Permit

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)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	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	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1100.00ft										
1,200.00	2.00	260.53	1,199.98	-0.29	-1.72	-0.29	2.00	2.00	0.00	260.53
1,300.00	4.00	260.53	1,299.84	-1.15	-6.88	-1.16	2.00	2.00	0.00	0.00
1,349.84	5.00	260.53	1,349.52	-1.79	-10.74	-1.81	2.00	2.00	0.00	0.00
End Nudge @ 1349.84ft										
1,400.00	5.00	260.53	1,399.49	-2.51	-15.05	-2.53	0.00	0.00	0.00	0.00
1,500.00	5.00	260.53	1,499.11	-3.94	-23.64	-3.98	0.00	0.00	0.00	0.00
1,600.00	5.00	260.53	1,598.73	-5.38	-32.23	-5.42	0.00	0.00	0.00	0.00
1,700.00	5.00	260.53	1,698.35	-6.81	-40.82	-6.87	0.00	0.00	0.00	0.00
1,800.00	5.00	260.53	1,797.97	-8.24	-49.41	-8.31	0.00	0.00	0.00	0.00
1,900.00	5.00	260.53	1,897.59	-9.67	-58.01	-9.76	0.00	0.00	0.00	0.00
2,000.00	5.00	260.53	1,997.21	-11.11	-66.60	-11.20	0.00	0.00	0.00	0.00
2,100.00	5.00	260.53	2,096.83	-12.54	-75.19	-12.65	0.00	0.00	0.00	0.00
2,200.00	5.00	260.53	2,196.45	-13.97	-83.78	-14.09	0.00	0.00	0.00	0.00
2,300.00	5.00	260.53	2,296.07	-15.41	-92.37	-15.54	0.00	0.00	0.00	0.00
2,400.00	5.00	260.53	2,395.69	-16.84	-100.96	-16.98	0.00	0.00	0.00	0.00
2,500.00	5.00	260.53	2,495.31	-18.27	-109.55	-18.42	0.00	0.00	0.00	0.00
2,600.00	5.00	260.53	2,594.93	-19.70	-118.14	-19.87	0.00	0.00	0.00	0.00
2,700.00	5.00	260.53	2,694.55	-21.14	-126.74	-21.31	0.00	0.00	0.00	0.00
2,800.00	5.00	260.53	2,794.17	-22.57	-135.33	-22.76	0.00	0.00	0.00	0.00
2,900.00	5.00	260.53	2,893.79	-24.00	-143.92	-24.20	0.00	0.00	0.00	0.00
3,000.00	5.00	260.53	2,993.41	-25.44	-152.51	-25.65	0.00	0.00	0.00	0.00
3,100.00	5.00	260.53	3,093.03	-26.87	-161.10	-27.09	0.00	0.00	0.00	0.00
3,200.00	5.00	260.53	3,192.65	-28.30	-169.69	-28.54	0.00	0.00	0.00	0.00
3,300.00	5.00	260.53	3,292.27	-29.74	-178.28	-29.98	0.00	0.00	0.00	0.00
3,400.00	5.00	260.53	3,391.89	-31.17	-186.87	-31.43	0.00	0.00	0.00	0.00
3,500.00	5.00	260.53	3,491.51	-32.60	-195.47	-32.87	0.00	0.00	0.00	0.00
3,600.00	5.00	260.53	3,591.13	-34.03	-204.06	-34.32	0.00	0.00	0.00	0.00
3,700.00	5.00	260.53	3,690.75	-35.47	-212.65	-35.76	0.00	0.00	0.00	0.00
3,800.00	5.00	260.53	3,790.37	-36.90	-221.24	-37.21	0.00	0.00	0.00	0.00
3,900.00	5.00	260.53	3,889.99	-38.33	-229.83	-38.65	0.00	0.00	0.00	0.00
3,934.14	5.00	260.53	3,924.00	-38.82	-232.76	-39.15	0.00	0.00	0.00	0.00
Parkman										
4,000.00	5.00	260.53	3,989.61	-39.77	-238.42	-40.10	0.00	0.00	0.00	0.00
4,100.00	5.00	260.53	4,089.23	-41.20	-247.01	-41.54	0.00	0.00	0.00	0.00
4,200.00	5.00	260.53	4,188.85	-42.63	-255.61	-42.99	0.00	0.00	0.00	0.00
4,300.00	5.00	260.53	4,288.47	-44.06	-264.20	-44.43	0.00	0.00	0.00	0.00
4,335.66	5.00	260.53	4,324.00	-44.58	-267.26	-44.95	0.00	0.00	0.00	0.00
Sussex										
4,400.00	5.00	260.53	4,388.09	-45.50	-272.79	-45.88	0.00	0.00	0.00	0.00
4,500.00	5.00	260.53	4,487.71	-46.93	-281.38	-47.32	0.00	0.00	0.00	0.00
4,600.00	5.00	260.53	4,587.33	-48.36	-289.97	-48.77	0.00	0.00	0.00	0.00
4,700.00	5.00	260.53	4,686.95	-49.80	-298.56	-50.21	0.00	0.00	0.00	0.00
4,800.00	5.00	260.53	4,786.57	-51.23	-307.15	-51.66	0.00	0.00	0.00	0.00
4,900.00	5.00	260.53	4,886.19	-52.66	-315.74	-53.10	0.00	0.00	0.00	0.00

Plan Report for Kunzman 29N-5HZ - Plan D 0-Permit

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)	Toolface Azimuth (°)
5,000.00	5.00	260.53	4,985.81	-54.10	-324.34	-54.55	0.00	0.00	0.00	0.00
5,100.00	5.00	260.53	5,085.43	-55.53	-332.93	-55.99	0.00	0.00	0.00	0.00
5,200.00	5.00	260.53	5,185.05	-56.96	-341.52	-57.44	0.00	0.00	0.00	0.00
5,300.00	5.00	260.53	5,284.67	-58.39	-350.11	-58.88	0.00	0.00	0.00	0.00
5,400.00	5.00	260.53	5,384.29	-59.83	-358.70	-60.33	0.00	0.00	0.00	0.00
5,500.00	5.00	260.53	5,483.91	-61.26	-367.29	-61.77	0.00	0.00	0.00	0.00
5,600.00	5.00	260.53	5,583.53	-62.69	-375.88	-63.22	0.00	0.00	0.00	0.00
5,700.00	5.00	260.53	5,683.15	-64.13	-384.47	-64.66	0.00	0.00	0.00	0.00
5,800.00	5.00	260.53	5,782.77	-65.56	-393.07	-66.11	0.00	0.00	0.00	0.00
5,900.00	5.00	260.53	5,882.39	-66.99	-401.66	-67.55	0.00	0.00	0.00	0.00
6,000.00	5.00	260.53	5,982.01	-68.42	-410.25	-69.00	0.00	0.00	0.00	0.00
6,100.00	5.00	260.53	6,081.63	-69.86	-418.84	-70.44	0.00	0.00	0.00	0.00
6,200.00	5.00	260.53	6,181.25	-71.29	-427.43	-71.89	0.00	0.00	0.00	0.00
6,300.00	5.00	260.53	6,280.87	-72.72	-436.02	-73.33	0.00	0.00	0.00	0.00
6,400.00	5.00	260.53	6,380.49	-74.16	-444.61	-74.78	0.00	0.00	0.00	0.00
6,471.06	5.00	260.53	6,451.28	-75.17	-450.72	-75.80	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 6471.06ft										
6,500.00	5.00	260.53	6,480.11	-75.59	-453.21	-76.22	0.00	0.00	0.00	0.00
6,571.06	5.00	260.53	6,550.90	-76.61	-459.31	-77.25	0.00	0.00	0.00	0.00
Begin Build @ 6571.06ft										
6,600.00	5.34	292.87	6,579.73	-76.29	-461.79	-76.94	10.00	1.19	111.75	99.56
6,700.00	13.02	338.23	6,678.48	-63.99	-470.28	-64.65	10.00	7.68	45.36	67.34
6,800.00	22.58	348.16	6,773.60	-34.67	-478.42	-35.34	10.00	9.56	9.93	22.42
6,900.00	32.40	352.32	6,862.21	10.78	-485.96	10.11	10.00	9.82	4.16	12.93
7,000.00	42.30	354.69	6,941.61	70.99	-492.67	70.30	10.00	9.90	2.37	9.22
DLS=10/100'										
7,077.08	49.95	355.97	6,995.00	126.33	-497.15	125.63	10.00	9.93	1.66	7.33
Sharon Springs										
7,100.00	52.23	356.29	7,009.40	144.12	-498.36	143.42	10.00	9.94	1.42	6.44
7,200.00	62.17	357.52	7,063.50	227.95	-502.84	227.25	10.00	9.95	1.22	6.24
7,228.09	64.97	357.82	7,076.00	253.08	-503.86	252.38	10.00	9.95	1.07	5.57
Niobrara A										
7,286.54	70.79	358.40	7,098.00	307.18	-505.64	306.47	10.00	9.96	1.00	5.44
Niobrara B										
7,300.00	72.13	358.53	7,102.28	319.93	-505.98	319.23	10.00	9.96	0.96	5.22
7,400.00	82.09	359.44	7,124.56	417.28	-507.69	416.57	10.00	9.96	0.91	5.18
7,473.98	89.46	0.08	7,130.00	491.00	-508.00	490.29	10.00	9.96	0.86	4.97
End Build @ 7473.98ft - Nio.B (Target-Heel) - 7" - Kunzman 29N-5HZ_CP										
7,500.00	89.46	0.08	7,130.24	517.02	-507.96	516.31	0.00	0.00	0.00	0.00
7,600.00	89.46	0.08	7,131.18	617.02	-507.83	616.31	0.00	0.00	0.00	0.00
7,700.00	89.46	0.08	7,132.12	717.01	-507.69	716.30	0.00	0.00	0.00	0.00
7,800.00	89.46	0.08	7,133.06	817.01	-507.55	816.30	0.00	0.00	0.00	0.00
7,900.00	89.46	0.08	7,134.00	917.00	-507.42	916.29	0.00	0.00	0.00	0.00
8,000.00	89.46	0.08	7,134.94	1,017.00	-507.28	1,016.29	0.00	0.00	0.00	0.00
8,100.00	89.46	0.08	7,135.88	1,116.99	-507.15	1,116.28	0.00	0.00	0.00	0.00
8,200.00	89.46	0.08	7,136.81	1,216.99	-507.01	1,216.28	0.00	0.00	0.00	0.00
8,300.00	89.46	0.08	7,137.75	1,316.99	-506.87	1,316.28	0.00	0.00	0.00	0.00
8,400.00	89.46	0.08	7,138.69	1,416.98	-506.74	1,416.27	0.00	0.00	0.00	0.00
8,500.00	89.46	0.08	7,139.63	1,516.98	-506.60	1,516.27	0.00	0.00	0.00	0.00
8,600.00	89.46	0.08	7,140.57	1,616.97	-506.46	1,616.26	0.00	0.00	0.00	0.00
8,700.00	89.46	0.08	7,141.51	1,716.97	-506.33	1,716.26	0.00	0.00	0.00	0.00
8,800.00	89.46	0.08	7,142.45	1,816.96	-506.19	1,816.25	0.00	0.00	0.00	0.00
8,900.00	89.46	0.08	7,143.38	1,916.96	-506.05	1,916.25	0.00	0.00	0.00	0.00
9,000.00	89.46	0.08	7,144.32	2,016.95	-505.92	2,016.25	0.00	0.00	0.00	0.00
9,100.00	89.46	0.08	7,145.26	2,116.95	-505.78	2,116.24	0.00	0.00	0.00	0.00
9,200.00	89.46	0.08	7,146.20	2,216.94	-505.64	2,216.24	0.00	0.00	0.00	0.00
9,300.00	89.46	0.08	7,147.14	2,316.94	-505.51	2,316.23	0.00	0.00	0.00	0.00
9,400.00	89.46	0.08	7,148.08	2,416.94	-505.37	2,416.23	0.00	0.00	0.00	0.00
9,500.00	89.46	0.08	7,149.02	2,516.93	-505.23	2,516.22	0.00	0.00	0.00	0.00

Plan Report for Kunzman 29N-5HZ - Plan D 0-Permit

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)	Toolface Azimuth (°)
9,600.00	89.46	0.08	7,149.95	2,616.93	-505.10	2,616.22	0.00	0.00	0.00	0.00
9,700.00	89.46	0.08	7,150.89	2,716.92	-504.96	2,716.21	0.00	0.00	0.00	0.00
9,800.00	89.46	0.08	7,151.83	2,816.92	-504.82	2,816.21	0.00	0.00	0.00	0.00
9,900.00	89.46	0.08	7,152.77	2,916.91	-504.69	2,916.21	0.00	0.00	0.00	0.00
10,000.00	89.46	0.08	7,153.71	3,016.91	-504.55	3,016.20	0.00	0.00	0.00	0.00
10,100.00	89.46	0.08	7,154.65	3,116.90	-504.41	3,116.20	0.00	0.00	0.00	0.00
10,200.00	89.46	0.08	7,155.59	3,216.90	-504.28	3,216.19	0.00	0.00	0.00	0.00
10,300.00	89.46	0.08	7,156.52	3,316.90	-504.14	3,316.19	0.00	0.00	0.00	0.00
10,400.00	89.46	0.08	7,157.46	3,416.89	-504.01	3,416.18	0.00	0.00	0.00	0.00
10,500.00	89.46	0.08	7,158.40	3,516.89	-503.87	3,516.18	0.00	0.00	0.00	0.00
10,600.00	89.46	0.08	7,159.34	3,616.88	-503.73	3,616.17	0.00	0.00	0.00	0.00
10,700.00	89.46	0.08	7,160.28	3,716.88	-503.60	3,716.17	0.00	0.00	0.00	0.00
10,800.00	89.46	0.08	7,161.22	3,816.87	-503.46	3,816.17	0.00	0.00	0.00	0.00
10,900.00	89.46	0.08	7,162.16	3,916.87	-503.32	3,916.16	0.00	0.00	0.00	0.00
11,000.00	89.46	0.08	7,163.09	4,016.86	-503.19	4,016.16	0.00	0.00	0.00	0.00
11,100.00	89.46	0.08	7,164.03	4,116.86	-503.05	4,116.15	0.00	0.00	0.00	0.00
11,200.00	89.46	0.08	7,164.97	4,216.85	-502.91	4,216.15	0.00	0.00	0.00	0.00
11,300.00	89.46	0.08	7,165.91	4,316.85	-502.78	4,316.14	0.00	0.00	0.00	0.00
11,400.00	89.46	0.08	7,166.85	4,416.85	-502.64	4,416.14	0.00	0.00	0.00	0.00
11,500.00	89.46	0.08	7,167.79	4,516.84	-502.50	4,516.14	0.00	0.00	0.00	0.00
11,600.00	89.46	0.08	7,168.73	4,616.84	-502.37	4,616.13	0.00	0.00	0.00	0.00
11,700.00	89.46	0.08	7,169.66	4,716.83	-502.23	4,716.13	0.00	0.00	0.00	0.00
11,735.80	89.46	0.08	7,170.00	4,752.63	-502.18	4,751.92	0.00	0.00	0.00	0.00

TD Well @ 11735.80ft - Kunzman 29N-5HZ_BHL

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
1,100.00	1,100.00	0.00	0.00	Begin Nudge @ 1100.00ft
1,349.84	1,349.52	-1.79	-10.74	End Nudge @ 1349.84ft
6,471.06	6,451.28	-75.17	-450.72	Top of 4.5" Liner @ 6471.06ft
6,571.06	6,550.90	-76.61	-459.31	Begin Build @ 6571.06ft
7,000.00	6,941.61	70.99	-492.67	DLS=10/100'
7,473.98	7,130.00	491.00	-508.00	End Build @ 7473.98ft
11,735.80	7,170.00	4,752.63	-502.18	TD Well @ 11735.80ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
User	No Target (Freehand)	0.08	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,735.80	Plan D 0-Permit	MWD

Plan Report for Kunzman 29N-5HZ - Plan D 0-Permit**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
800.00	800.00	9 5/8"	9-5/8	13-1/2
7,473.98	7,130.00	7"	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,934.14	3,924.00	Parkman		0.00	
4,335.66	4,324.00	Sussex		0.00	
7,077.08	6,995.00	Sharon Springs		0.00	
7,228.09	7,076.00	Niobrara A		0.00	
7,286.54	7,098.00	Niobrara B		0.00	
7,473.98	7,130.00	Nio.B (Target-Heel)		0.00	
11,735.80	7,170.00	Nio. B (Target-Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Kunzman_SEC	0.00	0.01	-52.27	Polygon
Kunzman 29N-5HZ_BHL	7,170.00	4,752.63	-502.18	Point
Kunzman 29N-5HZ_CP	7,130.00	491.00	-508.00	Point
Kunzman 29N-5HZ_SHL	0.00	0.00	0.00	Point

North Reference Sheet for Sec. 8-T2N-R66W - Kunzman 29N-5HZ - Plan D 0

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

Vertical Depths are relative to RKB @ 17' @ 4875.00ft (Drilling Rig). Northing and Easting are relative to Kunzman 29N-5HZ

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 -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99995810

Grid Coordinates of Well: 1,301,807.50 ft N, 3,194,525.32 ft E

Geographical Coordinates of Well: 40° 09' 35.14" N, 104° 48' 14.44" W

Grid Convergence at Surface is: 0.45°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,735.80ft
the Bottom Hole Displacement is 4,779.09ft in the Direction of 353.97° (True).

Magnetic Convergence at surface is: -8.18° (4 June 2013, , BGGM2013)

