

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 27-T2N-R65W

Powers 3N-27HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

## Sperry Drilling Services

## Proposal Report

03 August, 2012

Well Coordinates: 1,281,754.62 N, 3,237,090.43 E (40° 06' 13.31" N, 104° 39' 08.68" W)

Ground Level: 4,949.00 ft

Local Coordinate Origin:

Centered on Well Powers 3N-27HZ

Viewing Datum:

RKB=17 @ 4966.00ft (Drilling Rig)

TVDs to System:

N

North Reference:

True

Unit System:

API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

**HALLIBURTON**

Project: Weld County, CO (NAD 83)  
 Site: Sec. 27-T2N-R65W  
 Well: Powers 3N-27HZ  
 Wellbore: Plan A Rev 0  
 Design: Plan A Rev 0 Permit

# Anadarko Petroleum Corp.

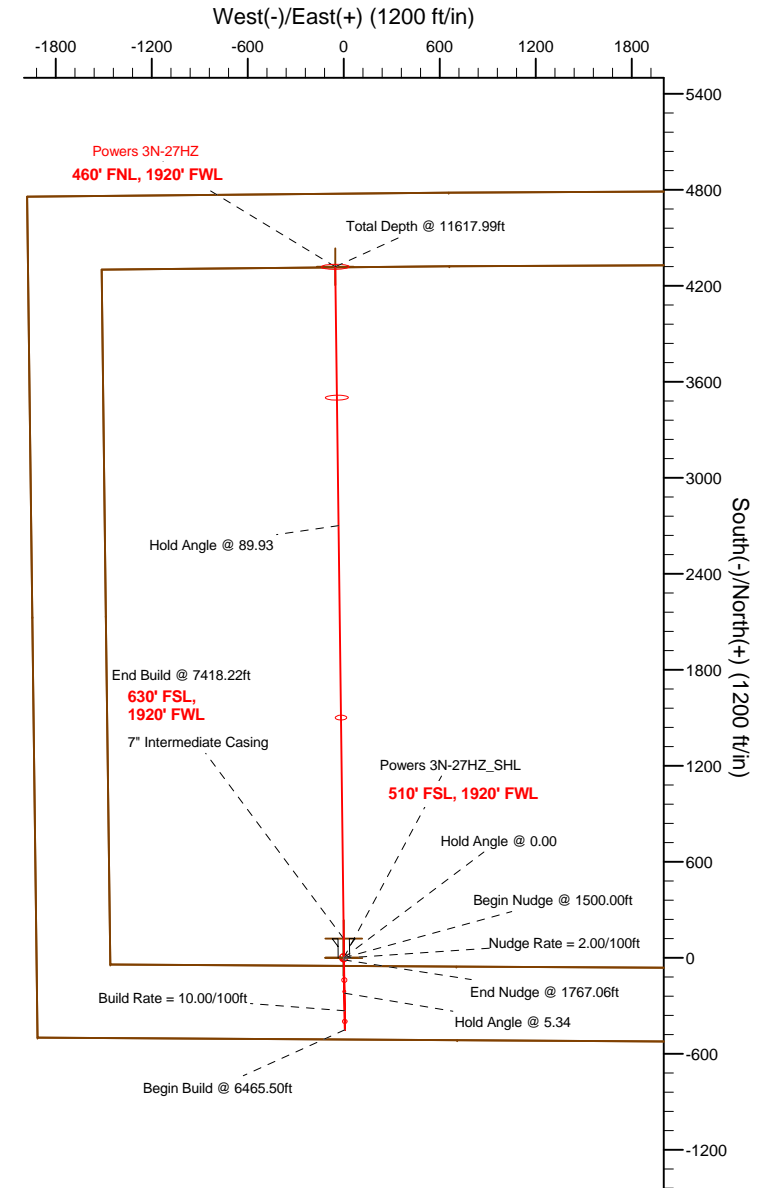
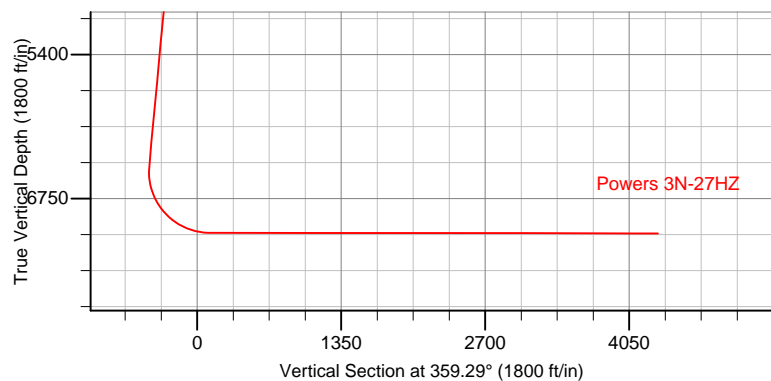
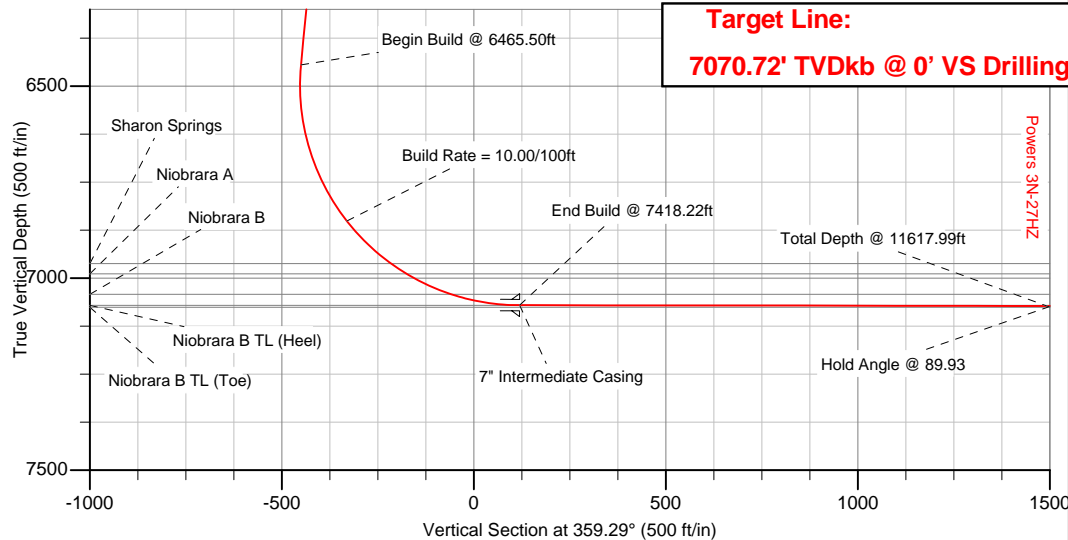


## SECTION DETAILS

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	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	
3	1767.06	5.34	179.10	1766.67	-12.44	0.20	2.00	179.10	-12.44	
4	6465.50	5.34	179.10	6444.71	-449.74	7.07	0.00	0.00	-449.80	
5	7418.22	89.93	359.27	7071.00	120.00	0.00	10.00	-179.83	119.99	Powers 3N-27HZ_Casing Point
6	11617.99	89.93	359.27	7076.00	4319.43	-53.42	0.00	0.00	4319.76	Powers 3N-27HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Powers 3N-27HZ_Section Lines	0.00	0.00	0.00	40.103698	-104.652411	Polygon
Powers 3N-27HZ_Setback Lines	0.00	0.00	0.00	40.103698	-104.652411	Polygon
Powers 3N-27HZ_SHL	0.00	0.00	0.00	40.103698	-104.652411	Point
Powers 3N-27HZ_Casing Point	7071.00	120.00	0.00	40.104027	-104.652411	Point
Powers 3N-27HZ_BHL	7076.00	4319.43	-53.42	40.115555	-104.652602	Point



## WELL DETAILS: Powers 3N-27HZ

Ground Level: 4949.00 RKB=17 @ 4966.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Powers 3N-27HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 08/03/2012  
 Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

**Plan Report for Powers 3N-27HZ - Plan A Rev 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
<b>Powers 3N-27HZ_SHL - Powers 3N-27HZ_Section Lines - Powers 3N-27HZ_Setback Lines</b>										
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
<b>Hold Angle @ 0.00</b>										
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
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,406.00	0.00	0.00	1,406.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Fox Hills</b>										
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 1500.00ft</b>										
1,600.00	2.00	179.10	1,599.98	-1.74	0.03	-1.75	2.00	2.00	0.00	179.10
<b>Nudge Rate = 2.00/100ft</b>										
1,700.00	4.00	179.10	1,699.84	-6.98	0.11	-6.98	2.00	2.00	0.00	0.00
1,767.06	5.34	179.10	1,766.67	-12.44	0.20	-12.44	2.00	2.00	0.00	0.00
<b>End Nudge @ 1767.06ft</b>										
1,800.00	5.34	179.10	1,799.47	-15.50	0.24	-15.51	0.00	0.00	0.00	0.00
1,900.00	5.34	179.10	1,899.04	-24.81	0.39	-24.81	0.00	0.00	0.00	0.00
2,000.00	5.34	179.10	1,998.60	-34.12	0.54	-34.12	0.00	0.00	0.00	0.00
2,100.00	5.34	179.10	2,098.17	-43.43	0.68	-43.43	0.00	0.00	0.00	0.00
2,200.00	5.34	179.10	2,197.73	-52.73	0.83	-52.74	0.00	0.00	0.00	0.00
2,300.00	5.34	179.10	2,297.30	-62.04	0.98	-62.05	0.00	0.00	0.00	0.00
2,400.00	5.34	179.10	2,396.87	-71.35	1.12	-71.36	0.00	0.00	0.00	0.00
2,500.00	5.34	179.10	2,496.43	-80.66	1.27	-80.67	0.00	0.00	0.00	0.00
2,600.00	5.34	179.10	2,596.00	-89.96	1.41	-89.97	0.00	0.00	0.00	0.00
2,700.00	5.34	179.10	2,695.56	-99.27	1.56	-99.28	0.00	0.00	0.00	0.00
2,800.00	5.34	179.10	2,795.13	-108.58	1.71	-108.59	0.00	0.00	0.00	0.00
2,900.00	5.34	179.10	2,894.69	-117.89	1.85	-117.90	0.00	0.00	0.00	0.00
3,000.00	5.34	179.10	2,994.26	-127.19	2.00	-127.21	0.00	0.00	0.00	0.00
3,100.00	5.34	179.10	3,093.83	-136.50	2.15	-136.52	0.00	0.00	0.00	0.00
3,200.00	5.34	179.10	3,193.39	-145.81	2.29	-145.83	0.00	0.00	0.00	0.00
3,300.00	5.34	179.10	3,292.96	-155.12	2.44	-155.13	0.00	0.00	0.00	0.00
3,400.00	5.34	179.10	3,392.52	-164.42	2.59	-164.44	0.00	0.00	0.00	0.00
3,500.00	5.34	179.10	3,492.09	-173.73	2.73	-173.75	0.00	0.00	0.00	0.00
3,600.00	5.34	179.10	3,591.65	-183.04	2.88	-183.06	0.00	0.00	0.00	0.00
3,700.00	5.34	179.10	3,691.22	-192.35	3.02	-192.37	0.00	0.00	0.00	0.00
3,800.00	5.34	179.10	3,790.79	-201.65	3.17	-201.68	0.00	0.00	0.00	0.00
3,900.00	5.34	179.10	3,890.35	-210.96	3.32	-210.99	0.00	0.00	0.00	0.00
4,000.00	5.34	179.10	3,989.92	-220.27	3.46	-220.29	0.00	0.00	0.00	0.00
<b>Hold Angle @ 5.34</b>										
4,100.00	5.34	179.10	4,089.48	-229.58	3.61	-229.60	0.00	0.00	0.00	0.00
4,200.00	5.34	179.10	4,189.05	-238.88	3.76	-238.91	0.00	0.00	0.00	0.00
4,300.00	5.34	179.10	4,288.62	-248.19	3.90	-248.22	0.00	0.00	0.00	0.00
4,400.00	5.34	179.10	4,388.18	-257.50	4.05	-257.53	0.00	0.00	0.00	0.00
4,500.00	5.34	179.10	4,487.75	-266.81	4.20	-266.84	0.00	0.00	0.00	0.00
4,600.00	5.34	179.10	4,587.31	-276.11	4.34	-276.15	0.00	0.00	0.00	0.00
4,700.00	5.34	179.10	4,686.88	-285.42	4.49	-285.45	0.00	0.00	0.00	0.00

**Plan Report for Powers 3N-27HZ - Plan A Rev 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 (°)
4,800.00	5.34	179.10	4,786.44	-294.73	4.63	-294.76	0.00	0.00	0.00	0.00
4,900.00	5.34	179.10	4,886.01	-304.04	4.78	-304.07	0.00	0.00	0.00	0.00
5,000.00	5.34	179.10	4,985.58	-313.34	4.93	-313.38	0.00	0.00	0.00	0.00
5,100.00	5.34	179.10	5,085.14	-322.65	5.07	-322.69	0.00	0.00	0.00	0.00
5,130.99	5.34	179.10	5,116.00	-325.54	5.12	-325.57	0.00	0.00	0.00	0.00
<b>Sussex</b>										
5,200.00	5.34	179.10	5,184.71	-331.96	5.22	-332.00	0.00	0.00	0.00	0.00
5,300.00	5.34	179.10	5,284.27	-341.27	5.37	-341.31	0.00	0.00	0.00	0.00
5,400.00	5.34	179.10	5,383.84	-350.57	5.51	-350.61	0.00	0.00	0.00	0.00
5,500.00	5.34	179.10	5,483.41	-359.88	5.66	-359.92	0.00	0.00	0.00	0.00
5,600.00	5.34	179.10	5,582.97	-369.19	5.81	-369.23	0.00	0.00	0.00	0.00
5,700.00	5.34	179.10	5,682.54	-378.50	5.95	-378.54	0.00	0.00	0.00	0.00
5,800.00	5.34	179.10	5,782.10	-387.80	6.10	-387.85	0.00	0.00	0.00	0.00
5,900.00	5.34	179.10	5,881.67	-397.11	6.24	-397.16	0.00	0.00	0.00	0.00
6,000.00	5.34	179.10	5,981.23	-406.42	6.39	-406.47	0.00	0.00	0.00	0.00
6,100.00	5.34	179.10	6,080.80	-415.73	6.54	-415.77	0.00	0.00	0.00	0.00
6,200.00	5.34	179.10	6,180.37	-425.03	6.68	-425.08	0.00	0.00	0.00	0.00
6,300.00	5.34	179.10	6,279.93	-434.34	6.83	-434.39	0.00	0.00	0.00	0.00
6,400.00	5.34	179.10	6,379.50	-443.65	6.98	-443.70	0.00	0.00	0.00	0.00
6,465.50	5.34	179.10	6,444.71	-449.74	7.07	-449.80	0.00	0.00	0.00	0.00
<b>Begin Build @ 6465.50ft</b>										
6,500.00	1.89	178.78	6,479.14	-451.92	7.11	-451.97	10.00	-10.00	-0.91	-179.83
6,600.00	8.11	359.38	6,578.87	-446.50	7.07	-446.56	10.00	6.22	-179.40	-179.51
6,700.00	18.11	359.32	6,676.14	-423.85	6.81	-423.90	10.00	10.00	-0.06	-0.11
6,800.00	28.11	359.30	6,767.99	-384.66	6.33	-384.70	10.00	10.00	-0.02	-0.05
6,900.00	38.11	359.29	6,851.65	-330.11	5.66	-330.15	10.00	10.00	-0.01	-0.03
<b>Build Rate = 10.00/100ft</b>										
7,000.00	48.11	359.29	6,924.56	-261.86	4.82	-261.90	10.00	10.00	-0.01	-0.03
7,059.63	54.07	359.28	6,962.00	-215.48	4.24	-215.52	10.00	10.00	0.00	-0.02
<b>Sharon Springs</b>										
7,100.00	58.11	359.28	6,984.52	-181.99	3.82	-182.02	10.00	10.00	0.00	-0.02
7,108.59	58.97	359.28	6,989.00	-174.66	3.73	-174.69	10.00	10.00	0.00	-0.02
<b>Niobrara A</b>										
7,200.00	68.11	359.28	7,029.69	-92.92	2.70	-92.95	10.00	10.00	0.00	-0.02
7,235.83	71.69	359.28	7,042.00	-59.28	2.27	-59.30	10.00	10.00	0.00	-0.02
<b>Niobrara B</b>										
7,300.00	78.11	359.27	7,058.71	2.64	1.49	2.62	10.00	10.00	0.00	-0.02
7,400.00	88.11	359.27	7,070.69	101.78	0.23	101.77	10.00	10.00	0.00	-0.02
7,418.22	89.93	359.27	7,071.00	120.00	0.00	119.99	10.00	10.00	0.00	-0.02
<b>End Build @ 7418.22ft - Niobrara B TL (Heel) - 7" Intermediate Casing - Powers 3N-27HZ_Casing Point</b>										
7,500.00	89.93	359.27	7,071.10	201.77	-1.04	201.77	0.00	0.00	0.00	-0.02
7,600.00	89.93	359.27	7,071.22	301.76	-2.31	301.77	0.00	0.00	0.00	0.00
7,700.00	89.93	359.27	7,071.34	401.75	-3.58	401.77	0.00	0.00	0.00	0.00
7,800.00	89.93	359.27	7,071.45	501.74	-4.86	501.77	0.00	0.00	0.00	0.00
7,900.00	89.93	359.27	7,071.57	601.74	-6.13	601.77	0.00	0.00	0.00	0.00
8,000.00	89.93	359.27	7,071.69	701.73	-7.40	701.77	0.00	0.00	0.00	0.00
8,100.00	89.93	359.27	7,071.81	801.72	-8.67	801.77	0.00	0.00	0.00	0.00
8,200.00	89.93	359.27	7,071.93	901.71	-9.94	901.77	0.00	0.00	0.00	0.00
8,300.00	89.93	359.27	7,072.05	1,001.70	-11.22	1,001.77	0.00	0.00	0.00	0.00
8,400.00	89.93	359.27	7,072.17	1,101.69	-12.49	1,101.77	0.00	0.00	0.00	0.00
8,500.00	89.93	359.27	7,072.29	1,201.69	-13.76	1,201.77	0.00	0.00	0.00	0.00
8,600.00	89.93	359.27	7,072.41	1,301.68	-15.03	1,301.76	0.00	0.00	0.00	0.00
8,700.00	89.93	359.27	7,072.53	1,401.67	-16.30	1,401.76	0.00	0.00	0.00	0.00
8,800.00	89.93	359.27	7,072.65	1,501.66	-17.58	1,501.76	0.00	0.00	0.00	0.00
8,900.00	89.93	359.27	7,072.76	1,601.65	-18.85	1,601.76	0.00	0.00	0.00	0.00
9,000.00	89.93	359.27	7,072.88	1,701.65	-20.12	1,701.76	0.00	0.00	0.00	0.00
9,100.00	89.93	359.27	7,073.00	1,801.64	-21.39	1,801.76	0.00	0.00	0.00	0.00
9,200.00	89.93	359.27	7,073.12	1,901.63	-22.66	1,901.76	0.00	0.00	0.00	0.00
9,300.00	89.93	359.27	7,073.24	2,001.62	-23.94	2,001.76	0.00	0.00	0.00	0.00

**Plan Report for Powers 3N-27HZ - Plan A Rev 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 (°)
9,400.00	89.93	359.27	7,073.36	2,101.61	-25.21	2,101.76	0.00	0.00	0.00	0.00
9,500.00	89.93	359.27	7,073.48	2,201.61	-26.48	2,201.76	0.00	0.00	0.00	0.00
9,600.00	89.93	359.27	7,073.60	2,301.60	-27.75	2,301.76	0.00	0.00	0.00	0.00
9,700.00	89.93	359.27	7,073.72	2,401.59	-29.02	2,401.76	0.00	0.00	0.00	0.00
9,800.00	89.93	359.27	7,073.84	2,501.58	-30.30	2,501.76	0.00	0.00	0.00	0.00
9,900.00	89.93	359.27	7,073.95	2,601.57	-31.57	2,601.76	0.00	0.00	0.00	0.00
10,000.00	89.93	359.27	7,074.07	2,701.56	-32.84	2,701.76	0.00	0.00	0.00	0.00
<b>Hold Angle @ 89.93</b>										
10,100.00	89.93	359.27	7,074.19	2,801.56	-34.11	2,801.76	0.00	0.00	0.00	0.00
10,200.00	89.93	359.27	7,074.31	2,901.55	-35.38	2,901.76	0.00	0.00	0.00	0.00
10,300.00	89.93	359.27	7,074.43	3,001.54	-36.66	3,001.76	0.00	0.00	0.00	0.00
10,400.00	89.93	359.27	7,074.55	3,101.53	-37.93	3,101.76	0.00	0.00	0.00	0.00
10,500.00	89.93	359.27	7,074.67	3,201.52	-39.20	3,201.76	0.00	0.00	0.00	0.00
10,600.00	89.93	359.27	7,074.79	3,301.52	-40.47	3,301.76	0.00	0.00	0.00	0.00
10,700.00	89.93	359.27	7,074.91	3,401.51	-41.74	3,401.76	0.00	0.00	0.00	0.00
10,800.00	89.93	359.27	7,075.03	3,501.50	-43.02	3,501.76	0.00	0.00	0.00	0.00
10,900.00	89.93	359.27	7,075.15	3,601.49	-44.29	3,601.76	0.00	0.00	0.00	0.00
11,000.00	89.93	359.27	7,075.26	3,701.48	-45.56	3,701.76	0.00	0.00	0.00	0.00
11,100.00	89.93	359.27	7,075.38	3,801.47	-46.83	3,801.76	0.00	0.00	0.00	0.00
11,200.00	89.93	359.27	7,075.50	3,901.47	-48.10	3,901.76	0.00	0.00	0.00	0.00
11,300.00	89.93	359.27	7,075.62	4,001.46	-49.38	4,001.76	0.00	0.00	0.00	0.00
11,400.00	89.93	359.27	7,075.74	4,101.45	-50.65	4,101.76	0.00	0.00	0.00	0.00
11,500.00	89.93	359.27	7,075.86	4,201.44	-51.92	4,201.76	0.00	0.00	0.00	0.00
11,600.00	89.93	359.27	7,075.98	4,301.43	-53.19	4,301.76	0.00	0.00	0.00	0.00
11,617.99	89.93	359.27	7,076.00	4,319.42	-53.42	4,319.75	0.00	0.00	0.00	0.00
<b>Total Depth @ 11617.99ft - Powers 3N-27HZ_BHL</b>										

**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
800.00	800.00	0.00	0.00	Hold Angle @ 0.00
1,500.00	1,500.00	0.00	0.00	Begin Nudge @ 1500.00ft
1,600.00	1,599.98	-1.74	0.03	Nudge Rate = 2.00/100ft
1,767.06	1,766.67	-12.44	0.20	End Nudge @ 1767.06ft
4,000.00	3,989.92	-220.27	3.46	Hold Angle @ 5.34
6,465.50	6,444.71	-449.74	7.07	Begin Build @ 6465.50ft
6,900.00	6,851.65	-330.11	5.66	Build Rate = 10.00/100ft
7,418.22	7,071.00	120.00	0.00	End Build @ 7418.22ft
10,000.00	7,074.07	2,701.56	-32.84	Hold Angle @ 89.93
11,617.99	7,076.00	4,319.42	-53.42	Total Depth @ 11617.99ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target	Powers 3N-27HZ_BHL	359.29	Slot	0.00	0.00	7,076.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,617.99	Plan A Rev 0 Permit	MWD

**Plan Report for Powers 3N-27HZ - Plan A Rev 0 Permit****Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,418.22	7,071.00	7" Intermediate Casing	7	8-3/4

**Formation Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,406.00	1,406.00	Fox Hills		0.00	
5,130.99	5,116.00	Sussex		0.00	
7,059.63	6,962.00	Sharon Springs		0.00	
7,108.59	6,989.00	Niobrara A		0.00	
7,235.83	7,042.00	Niobrara B		0.00	
7,418.22	7,071.00	Niobrara B TL (Heel)		0.00	
11,617.99	7,076.00	Niobrara B TL (Toe)		0.00	

***Targets associated with this wellbore***

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Powers 3N-27HZ_Setback Lines	0.00	0.00	0.00	Polygon
Powers 3N-27HZ_BHL	7,076.00	4,319.43	-53.42	Point
Powers 3N-27HZ_Section Lines	0.00	0.00	0.00	Polygon
Powers 3N-27HZ_Casing Point	7,071.00	120.00	0.00	Point
Powers 3N-27HZ_SHL	0.00	0.00	0.00	Point

## North Reference Sheet for Sec. 27-T2N-R65W - Powers 3N-27HZ - Plan A Rev 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 @ 4966.00ft (Drilling Rig). Northing and Easting are relative to Powers 3N-27HZ

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: 3,000,000.000644ft, False Northing: 1,000,000.001308ft, Scale Reduction: 0.99996012

Grid Coordinates of Well: 1,281,754.620033 ft N, 3,237,090.426740 ft E

Geographical Coordinates of Well: 40° 06' 13.31" N, 104° 39' 08.68" W

Grid Convergence at Surface is: 0.55°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,617.99ft  
the Bottom Hole Displacement is 4,319.75ft in the Direction of 359.29° (True).

Magnetic Convergence at surface is: -8.07° ( 2 August 2012, , BGGM2011)

