

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 17-T1N-R67W

Griffiths 35N-20HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

## Sperry Drilling Services

## Proposal Report

11 September, 2012

Well Coordinates: 1,264,173.58 N, 3,163,028.48 E (40° 03' 25.47" N, 104° 55' 03.30" W)

Ground Level: 5,056.00 ft

Local Coordinate Origin:

Centered on Well Griffiths 35N-20HZ

Viewing Datum:

RKB=17 @ 5073.00ft (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. 17-T1N-R67W  
Well: Griffiths 35N-20HZ  
Wellbore: Plan A Rev 0  
Design: Plan A Rev 0 Permit

# Anadarko Petroleum Corp.

**HALLIBURTON**  
Sperry Drilling

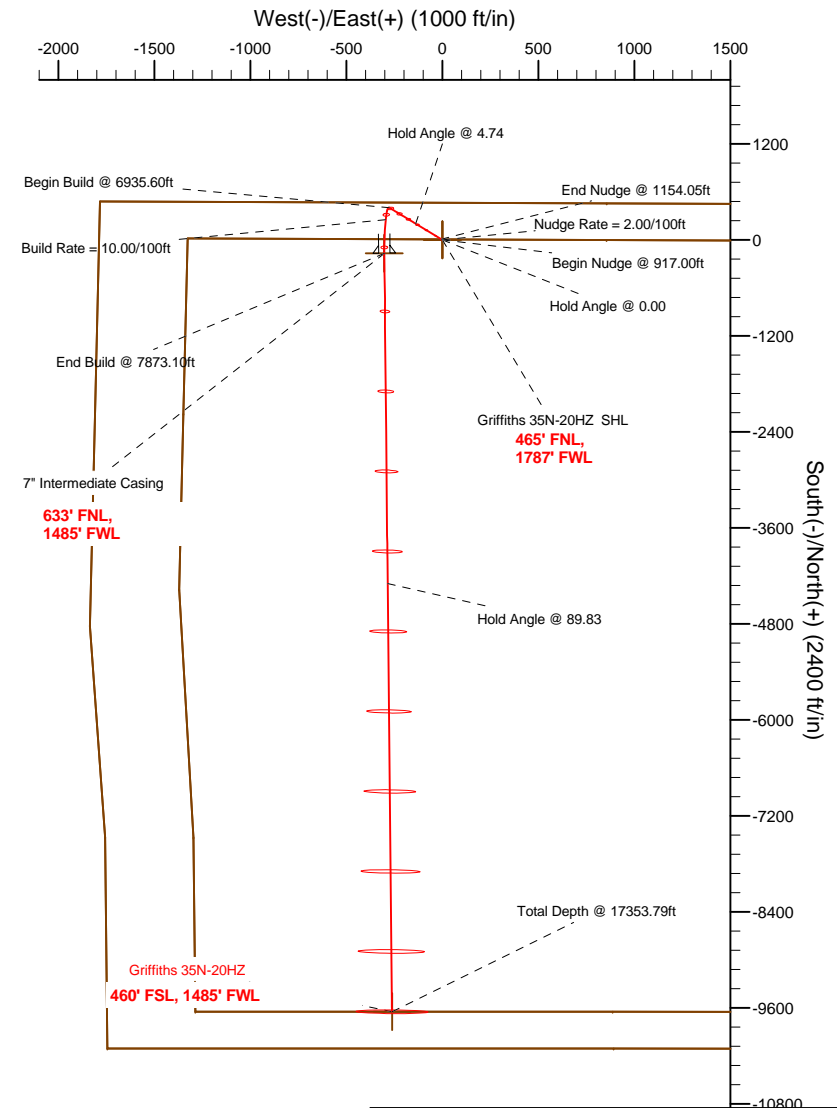
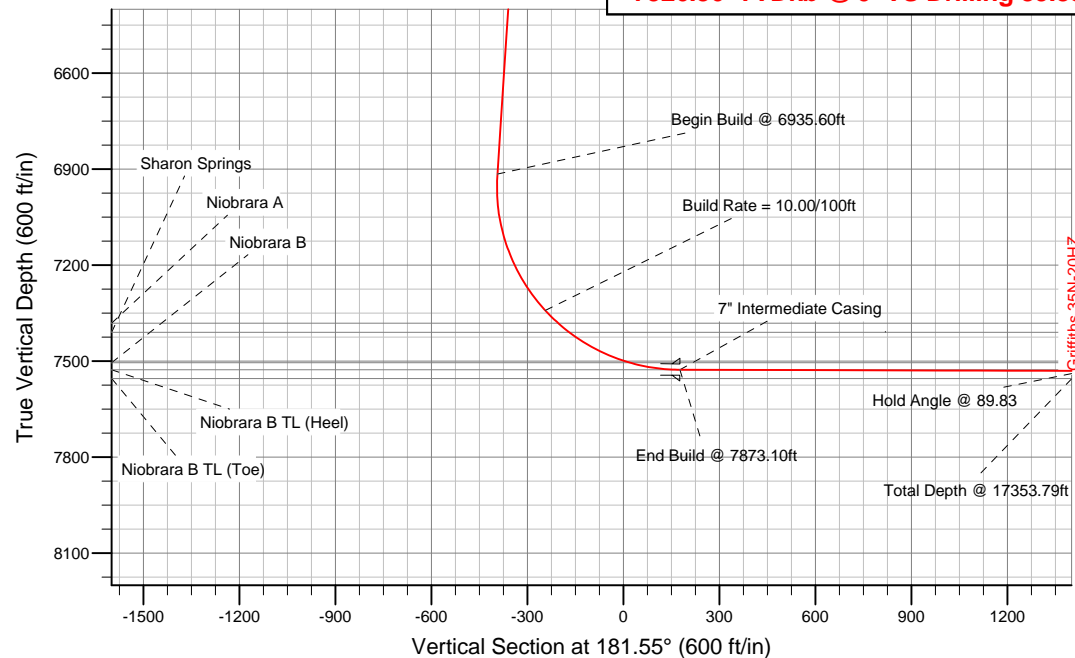
## SECTION DETAILS

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	917.00	0.00	0.00	917.00	0.00	0.00	0.00	0.00	0.00	
3	1154.05	4.74	325.53	1153.78	8.08	-5.55	2.00	325.53	-7.93	
4	6935.60	4.74	325.53	6915.55	402.04	-275.98	0.00	0.00	-394.41	
5	7873.10	89.83	179.76	7527.00	-168.00	-302.00	10.00	-145.69	176.13	Griffiths 35N-20HZ_Casing Point
6	17353.79	89.83	179.76	7555.00	-9648.56	-261.84	0.00	0.00	9652.11	Griffiths 35N-20HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Griffiths 35N-20HZ_Section Line	0.00	0.00	0.00	40.057076	-104.917583	Polygon
Griffiths 35N-20HZ_Setback Line	0.00	0.00	0.00	40.057076	-104.917583	Polygon
Griffiths 35N-20HZ_SHL	0.00	0.00	0.00	40.057076	-104.917583	Point
Griffiths 35N-20HZ_Casing Point	7527.00	-168.00	-302.00	40.056615	-104.918662	Point
Griffiths 35N-20HZ_BHL	7555.00	-9648.56	-261.84	40.030590	-104.918518	Point

**Target Line:**  
**7526.36' TVDkb @ 0° VS Drilling 89.83°**



WELL DETAILS: Griffiths 35N-20HZ

Ground Level: 5056.00 RKB=17 @ 5073.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Griffiths 35N-20HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 09/11/2012  
Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

**Plan Report for Griffiths 35N-20HZ - 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>Griffiths 35N-20HZ_SHL - Griffiths 35N-20HZ_Section Line - Griffiths 35N-20HZ_Setback Line</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
<b>Hold Angle @ 0.00</b>										
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
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
917.00	0.00	0.00	917.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Begin Nudge @ 917.00ft</b>										
1,000.00	1.66	325.53	999.99	0.99	-0.68	-0.97	2.00	2.00	0.00	325.53
<b>Nudge Rate = 2.00/100ft</b>										
1,100.00	3.66	325.53	1,099.88	4.82	-3.31	-4.73	2.00	2.00	0.00	0.00
1,154.05	4.74	325.53	1,153.78	8.08	-5.55	-7.93	2.00	2.00	0.00	0.00
<b>End Nudge @ 1154.05ft</b>										
1,200.00	4.74	325.53	1,199.57	11.21	-7.70	-11.00	0.00	0.00	0.00	0.00
1,300.00	4.74	325.53	1,299.23	18.03	-12.37	-17.68	0.00	0.00	0.00	0.00
1,400.00	4.74	325.53	1,398.89	24.84	-17.05	-24.37	0.00	0.00	0.00	0.00
1,500.00	4.74	325.53	1,498.55	31.65	-21.73	-31.05	0.00	0.00	0.00	0.00
1,600.00	4.74	325.53	1,598.20	38.47	-26.41	-37.74	0.00	0.00	0.00	0.00
1,700.00	4.74	325.53	1,697.86	45.28	-31.08	-44.42	0.00	0.00	0.00	0.00
1,800.00	4.74	325.53	1,797.52	52.10	-35.76	-51.11	0.00	0.00	0.00	0.00
1,900.00	4.74	325.53	1,897.18	58.91	-40.44	-57.79	0.00	0.00	0.00	0.00
2,000.00	4.74	325.53	1,996.84	65.73	-45.12	-64.48	0.00	0.00	0.00	0.00
2,100.00	4.74	325.53	2,096.49	72.54	-49.79	-71.16	0.00	0.00	0.00	0.00
2,200.00	4.74	325.53	2,196.15	79.35	-54.47	-77.85	0.00	0.00	0.00	0.00
2,300.00	4.74	325.53	2,295.81	86.17	-59.15	-84.53	0.00	0.00	0.00	0.00
2,400.00	4.74	325.53	2,395.47	92.98	-63.83	-91.22	0.00	0.00	0.00	0.00
2,500.00	4.74	325.53	2,495.12	99.80	-68.50	-97.90	0.00	0.00	0.00	0.00
2,600.00	4.74	325.53	2,594.78	106.61	-73.18	-104.59	0.00	0.00	0.00	0.00
2,700.00	4.74	325.53	2,694.44	113.42	-77.86	-111.27	0.00	0.00	0.00	0.00
2,800.00	4.74	325.53	2,794.10	120.24	-82.54	-117.96	0.00	0.00	0.00	0.00
2,900.00	4.74	325.53	2,893.76	127.05	-87.21	-124.64	0.00	0.00	0.00	0.00
3,000.00	4.74	325.53	2,993.41	133.87	-91.89	-131.32	0.00	0.00	0.00	0.00
3,100.00	4.74	325.53	3,093.07	140.68	-96.57	-138.01	0.00	0.00	0.00	0.00
3,200.00	4.74	325.53	3,192.73	147.49	-101.25	-144.69	0.00	0.00	0.00	0.00
3,300.00	4.74	325.53	3,292.39	154.31	-105.92	-151.38	0.00	0.00	0.00	0.00
3,400.00	4.74	325.53	3,392.05	161.12	-110.60	-158.06	0.00	0.00	0.00	0.00
3,500.00	4.74	325.53	3,491.70	167.94	-115.28	-164.75	0.00	0.00	0.00	0.00
3,600.00	4.74	325.53	3,591.36	174.75	-119.96	-171.43	0.00	0.00	0.00	0.00
3,700.00	4.74	325.53	3,691.02	181.57	-124.63	-178.12	0.00	0.00	0.00	0.00
3,800.00	4.74	325.53	3,790.68	188.38	-129.31	-184.80	0.00	0.00	0.00	0.00
3,900.00	4.74	325.53	3,890.33	195.19	-133.99	-191.49	0.00	0.00	0.00	0.00
4,000.00	4.74	325.53	3,989.99	202.01	-138.67	-198.17	0.00	0.00	0.00	0.00
<b>Hold Angle @ 4.74</b>										
4,100.00	4.74	325.53	4,089.65	208.82	-143.34	-204.86	0.00	0.00	0.00	0.00
4,200.00	4.74	325.53	4,189.31	215.64	-148.02	-211.54	0.00	0.00	0.00	0.00
4,300.00	4.74	325.53	4,288.97	222.45	-152.70	-218.23	0.00	0.00	0.00	0.00
4,400.00	4.74	325.53	4,388.62	229.26	-157.38	-224.91	0.00	0.00	0.00	0.00
4,500.00	4.74	325.53	4,488.28	236.08	-162.05	-231.60	0.00	0.00	0.00	0.00
4,566.95	4.74	325.53	4,555.00	240.64	-165.18	-236.07	0.00	0.00	0.00	0.00
<b>Sussex</b>										
4,600.00	4.74	325.53	4,587.94	242.89	-166.73	-238.28	0.00	0.00	0.00	0.00

**Plan Report for Griffiths 35N-20HZ - 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 (°)
4,700.00	4.74	325.53	4,687.60	249.71	-171.41	-244.96	0.00	0.00	0.00	0.00
4,800.00	4.74	325.53	4,787.26	256.52	-176.09	-251.65	0.00	0.00	0.00	0.00
4,900.00	4.74	325.53	4,886.91	263.33	-180.76	-258.33	0.00	0.00	0.00	0.00
5,000.00	4.74	325.53	4,986.57	270.15	-185.44	-265.02	0.00	0.00	0.00	0.00
5,100.00	4.74	325.53	5,086.23	276.96	-190.12	-271.70	0.00	0.00	0.00	0.00
5,159.98	4.74	325.53	5,146.00	281.05	-192.92	-275.71	0.00	0.00	0.00	0.00
<b>Shannon</b>										
5,200.00	4.74	325.53	5,185.89	283.78	-194.80	-278.39	0.00	0.00	0.00	0.00
5,300.00	4.74	325.53	5,285.54	290.59	-199.47	-285.07	0.00	0.00	0.00	0.00
5,400.00	4.74	325.53	5,385.20	297.41	-204.15	-291.76	0.00	0.00	0.00	0.00
5,500.00	4.74	325.53	5,484.86	304.22	-208.83	-298.44	0.00	0.00	0.00	0.00
5,600.00	4.74	325.53	5,584.52	311.03	-213.51	-305.13	0.00	0.00	0.00	0.00
5,700.00	4.74	325.53	5,684.18	317.85	-218.18	-311.81	0.00	0.00	0.00	0.00
5,800.00	4.74	325.53	5,783.83	324.66	-222.86	-318.50	0.00	0.00	0.00	0.00
5,900.00	4.74	325.53	5,883.49	331.48	-227.54	-325.18	0.00	0.00	0.00	0.00
6,000.00	4.74	325.53	5,983.15	338.29	-232.22	-331.87	0.00	0.00	0.00	0.00
6,100.00	4.74	325.53	6,082.81	345.10	-236.89	-338.55	0.00	0.00	0.00	0.00
6,200.00	4.74	325.53	6,182.47	351.92	-241.57	-345.24	0.00	0.00	0.00	0.00
6,300.00	4.74	325.53	6,282.12	358.73	-246.25	-351.92	0.00	0.00	0.00	0.00
6,400.00	4.74	325.53	6,381.78	365.55	-250.93	-358.61	0.00	0.00	0.00	0.00
6,500.00	4.74	325.53	6,481.44	372.36	-255.60	-365.29	0.00	0.00	0.00	0.00
6,600.00	4.74	325.53	6,581.10	379.18	-260.28	-371.97	0.00	0.00	0.00	0.00
6,700.00	4.74	325.53	6,680.75	385.99	-264.96	-378.66	0.00	0.00	0.00	0.00
6,800.00	4.74	325.53	6,780.41	392.80	-269.64	-385.34	0.00	0.00	0.00	0.00
6,900.00	4.74	325.53	6,880.07	399.62	-274.31	-392.03	0.00	0.00	0.00	0.00
6,935.60	4.74	325.53	6,915.55	402.04	-275.98	-394.41	0.00	0.00	0.00	0.00
<b>Begin Build @ 6935.60ft</b>										
7,000.00	3.67	226.37	6,979.84	402.82	-278.98	-395.10	10.00	-1.66	-153.98	-145.69
7,100.00	12.80	191.60	7,078.75	389.72	-283.53	-381.89	10.00	9.13	-34.77	-46.68
7,200.00	22.67	186.16	7,173.88	359.64	-287.84	-351.70	10.00	9.87	-5.44	-12.14
7,300.00	32.62	183.93	7,262.36	313.47	-291.76	-305.44	10.00	9.95	-2.23	-6.94
7,400.00	42.59	182.66	7,341.48	252.63	-295.19	-244.53	10.00	9.97	-1.27	-4.96
<b>Build Rate = 10.00/100ft</b>										
7,456.30	48.21	182.14	7,381.00	212.60	-296.86	-204.46	10.00	9.98	-0.92	-3.95
<b>Niobrara A</b>										
7,500.00	52.57	181.80	7,408.86	178.96	-298.01	-170.81	10.00	9.98	-0.79	-3.58
7,501.88	52.76	181.78	7,410.00	177.46	-298.05	-169.31	10.00	9.98	-0.74	-3.36
<b>Sharon Springs</b>										
7,600.00	62.55	181.14	7,462.43	94.69	-300.14	-86.52	10.00	9.98	-0.66	-3.35
7,700.00	72.54	180.59	7,500.58	2.40	-301.51	5.78	10.00	9.99	-0.55	-3.01
7,715.41	74.08	180.51	7,505.00	-12.35	-301.65	20.53	10.00	9.99	-0.51	-2.80
<b>Niobrara B</b>										
7,800.00	82.53	180.10	7,522.13	-95.11	-302.09	103.27	10.00	9.99	-0.49	-2.78
7,873.10	89.83	179.76	7,527.00	-168.00	-302.00	176.13	10.00	9.99	-0.47	-2.69
<b>End Build @ 7873.10ft - Niobrara B TL (Heel) - 7" Intermediate Casing - Griffiths 35N-20HZ_Casing Point</b>										
7,900.00	89.83	179.76	7,527.08	-194.90	-301.89	203.02	0.00	0.00	0.00	-2.67
8,000.00	89.83	179.76	7,527.37	-294.90	-301.46	302.97	0.00	0.00	0.00	0.00
8,100.00	89.83	179.76	7,527.67	-394.90	-301.04	402.92	0.00	0.00	0.00	0.00
8,200.00	89.83	179.76	7,527.97	-494.90	-300.62	502.87	0.00	0.00	0.00	0.00
8,300.00	89.83	179.76	7,528.26	-594.90	-300.19	602.82	0.00	0.00	0.00	0.00
8,400.00	89.83	179.76	7,528.56	-694.90	-299.77	702.77	0.00	0.00	0.00	0.00
8,500.00	89.83	179.76	7,528.85	-794.89	-299.34	802.72	0.00	0.00	0.00	0.00
8,600.00	89.83	179.76	7,529.15	-894.89	-298.92	902.67	0.00	0.00	0.00	0.00
8,700.00	89.83	179.76	7,529.44	-994.89	-298.50	1,002.62	0.00	0.00	0.00	0.00
8,800.00	89.83	179.76	7,529.74	-1,094.89	-298.07	1,102.57	0.00	0.00	0.00	0.00
8,900.00	89.83	179.76	7,530.03	-1,194.89	-297.65	1,202.52	0.00	0.00	0.00	0.00
9,000.00	89.83	179.76	7,530.33	-1,294.89	-297.23	1,302.47	0.00	0.00	0.00	0.00
9,100.00	89.83	179.76	7,530.62	-1,394.89	-296.80	1,402.42	0.00	0.00	0.00	0.00
9,200.00	89.83	179.76	7,530.92	-1,494.89	-296.38	1,502.37	0.00	0.00	0.00	0.00

**Plan Report for Griffiths 35N-20HZ - 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 (°)
9,300.00	89.83	179.76	7,531.21	-1,594.88	-295.96	1,602.33	0.00	0.00	0.00	0.00
9,400.00	89.83	179.76	7,531.51	-1,694.88	-295.53	1,702.28	0.00	0.00	0.00	0.00
9,500.00	89.83	179.76	7,531.80	-1,794.88	-295.11	1,802.23	0.00	0.00	0.00	0.00
9,600.00	89.83	179.76	7,532.10	-1,894.88	-294.68	1,902.18	0.00	0.00	0.00	0.00
9,700.00	89.83	179.76	7,532.40	-1,994.88	-294.26	2,002.13	0.00	0.00	0.00	0.00
9,800.00	89.83	179.76	7,532.69	-2,094.88	-293.84	2,102.08	0.00	0.00	0.00	0.00
9,900.00	89.83	179.76	7,532.99	-2,194.88	-293.41	2,202.03	0.00	0.00	0.00	0.00
10,000.00	89.83	179.76	7,533.28	-2,294.87	-292.99	2,301.98	0.00	0.00	0.00	0.00
10,100.00	89.83	179.76	7,533.58	-2,394.87	-292.57	2,401.93	0.00	0.00	0.00	0.00
10,200.00	89.83	179.76	7,533.87	-2,494.87	-292.14	2,501.88	0.00	0.00	0.00	0.00
10,300.00	89.83	179.76	7,534.17	-2,594.87	-291.72	2,601.83	0.00	0.00	0.00	0.00
10,400.00	89.83	179.76	7,534.46	-2,694.87	-291.30	2,701.78	0.00	0.00	0.00	0.00
10,500.00	89.83	179.76	7,534.76	-2,794.87	-290.87	2,801.73	0.00	0.00	0.00	0.00
10,600.00	89.83	179.76	7,535.05	-2,894.87	-290.45	2,901.68	0.00	0.00	0.00	0.00
10,700.00	89.83	179.76	7,535.35	-2,994.87	-290.02	3,001.63	0.00	0.00	0.00	0.00
10,800.00	89.83	179.76	7,535.64	-3,094.86	-289.60	3,101.58	0.00	0.00	0.00	0.00
10,900.00	89.83	179.76	7,535.94	-3,194.86	-289.18	3,201.53	0.00	0.00	0.00	0.00
11,000.00	89.83	179.76	7,536.23	-3,294.86	-288.75	3,301.48	0.00	0.00	0.00	0.00
11,100.00	89.83	179.76	7,536.53	-3,394.86	-288.33	3,401.43	0.00	0.00	0.00	0.00
11,200.00	89.83	179.76	7,536.83	-3,494.86	-287.91	3,501.38	0.00	0.00	0.00	0.00
11,300.00	89.83	179.76	7,537.12	-3,594.86	-287.48	3,601.33	0.00	0.00	0.00	0.00
11,400.00	89.83	179.76	7,537.42	-3,694.86	-287.06	3,701.28	0.00	0.00	0.00	0.00
11,500.00	89.83	179.76	7,537.71	-3,794.85	-286.63	3,801.23	0.00	0.00	0.00	0.00
11,600.00	89.83	179.76	7,538.01	-3,894.85	-286.21	3,901.18	0.00	0.00	0.00	0.00
11,700.00	89.83	179.76	7,538.30	-3,994.85	-285.79	4,001.13	0.00	0.00	0.00	0.00
11,800.00	89.83	179.76	7,538.60	-4,094.85	-285.36	4,101.08	0.00	0.00	0.00	0.00
11,900.00	89.83	179.76	7,538.89	-4,194.85	-284.94	4,201.03	0.00	0.00	0.00	0.00
12,000.00	89.83	179.76	7,539.19	-4,294.85	-284.52	4,300.99	0.00	0.00	0.00	0.00
<b>Hold Angle @ 89.83</b>										
12,100.00	89.83	179.76	7,539.48	-4,394.85	-284.09	4,400.94	0.00	0.00	0.00	0.00
12,200.00	89.83	179.76	7,539.78	-4,494.85	-283.67	4,500.89	0.00	0.00	0.00	0.00
12,300.00	89.83	179.76	7,540.07	-4,594.84	-283.25	4,600.84	0.00	0.00	0.00	0.00
12,400.00	89.83	179.76	7,540.37	-4,694.84	-282.82	4,700.79	0.00	0.00	0.00	0.00
12,500.00	89.83	179.76	7,540.66	-4,794.84	-282.40	4,800.74	0.00	0.00	0.00	0.00
12,600.00	89.83	179.76	7,540.96	-4,894.84	-281.97	4,900.69	0.00	0.00	0.00	0.00
12,700.00	89.83	179.76	7,541.26	-4,994.84	-281.55	5,000.64	0.00	0.00	0.00	0.00
12,800.00	89.83	179.76	7,541.55	-5,094.84	-281.13	5,100.59	0.00	0.00	0.00	0.00
12,900.00	89.83	179.76	7,541.85	-5,194.84	-280.70	5,200.54	0.00	0.00	0.00	0.00
13,000.00	89.83	179.76	7,542.14	-5,294.83	-280.28	5,300.49	0.00	0.00	0.00	0.00
13,100.00	89.83	179.76	7,542.44	-5,394.83	-279.86	5,400.44	0.00	0.00	0.00	0.00
13,200.00	89.83	179.76	7,542.73	-5,494.83	-279.43	5,500.39	0.00	0.00	0.00	0.00
13,300.00	89.83	179.76	7,543.03	-5,594.83	-279.01	5,600.34	0.00	0.00	0.00	0.00
13,400.00	89.83	179.76	7,543.32	-5,694.83	-278.59	5,700.29	0.00	0.00	0.00	0.00
13,500.00	89.83	179.76	7,543.62	-5,794.83	-278.16	5,800.24	0.00	0.00	0.00	0.00
13,600.00	89.83	179.76	7,543.91	-5,894.83	-277.74	5,900.19	0.00	0.00	0.00	0.00
13,700.00	89.83	179.76	7,544.21	-5,994.83	-277.31	6,000.14	0.00	0.00	0.00	0.00
13,800.00	89.83	179.76	7,544.50	-6,094.82	-276.89	6,100.09	0.00	0.00	0.00	0.00
13,900.00	89.83	179.76	7,544.80	-6,194.82	-276.47	6,200.04	0.00	0.00	0.00	0.00
14,000.00	89.83	179.76	7,545.10	-6,294.82	-276.04	6,299.99	0.00	0.00	0.00	0.00
14,100.00	89.83	179.76	7,545.39	-6,394.82	-275.62	6,399.94	0.00	0.00	0.00	0.00
14,200.00	89.83	179.76	7,545.69	-6,494.82	-275.20	6,499.89	0.00	0.00	0.00	0.00
14,300.00	89.83	179.76	7,545.98	-6,594.82	-274.77	6,599.84	0.00	0.00	0.00	0.00
14,400.00	89.83	179.76	7,546.28	-6,694.82	-274.35	6,699.79	0.00	0.00	0.00	0.00
14,500.00	89.83	179.76	7,546.57	-6,794.81	-273.93	6,799.74	0.00	0.00	0.00	0.00
14,600.00	89.83	179.76	7,546.87	-6,894.81	-273.50	6,899.70	0.00	0.00	0.00	0.00
14,700.00	89.83	179.76	7,547.16	-6,994.81	-273.08	6,999.65	0.00	0.00	0.00	0.00
14,800.00	89.83	179.76	7,547.46	-7,094.81	-272.65	7,099.60	0.00	0.00	0.00	0.00
14,900.00	89.83	179.76	7,547.75	-7,194.81	-272.23	7,199.55	0.00	0.00	0.00	0.00
15,000.00	89.83	179.76	7,548.05	-7,294.81	-271.81	7,299.50	0.00	0.00	0.00	0.00

**Plan Report for Griffiths 35N-20HZ - 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 (°)
15,100.00	89.83	179.76	7,548.34	-7,394.81	-271.38	7,399.45	0.00	0.00	0.00	0.00
15,200.00	89.83	179.76	7,548.64	-7,494.81	-270.96	7,499.40	0.00	0.00	0.00	0.00
15,300.00	89.83	179.76	7,548.93	-7,594.80	-270.54	7,599.35	0.00	0.00	0.00	0.00
15,400.00	89.83	179.76	7,549.23	-7,694.80	-270.11	7,699.30	0.00	0.00	0.00	0.00
15,500.00	89.83	179.76	7,549.53	-7,794.80	-269.69	7,799.25	0.00	0.00	0.00	0.00
15,600.00	89.83	179.76	7,549.82	-7,894.80	-269.27	7,899.20	0.00	0.00	0.00	0.00
15,700.00	89.83	179.76	7,550.12	-7,994.80	-268.84	7,999.15	0.00	0.00	0.00	0.00
15,800.00	89.83	179.76	7,550.41	-8,094.80	-268.42	8,099.10	0.00	0.00	0.00	0.00
15,900.00	89.83	179.76	7,550.71	-8,194.80	-267.99	8,199.05	0.00	0.00	0.00	0.00
16,000.00	89.83	179.76	7,551.00	-8,294.79	-267.57	8,299.00	0.00	0.00	0.00	0.00
16,100.00	89.83	179.76	7,551.30	-8,394.79	-267.15	8,398.95	0.00	0.00	0.00	0.00
16,200.00	89.83	179.76	7,551.59	-8,494.79	-266.72	8,498.90	0.00	0.00	0.00	0.00
16,300.00	89.83	179.76	7,551.89	-8,594.79	-266.30	8,598.85	0.00	0.00	0.00	0.00
16,400.00	89.83	179.76	7,552.18	-8,694.79	-265.88	8,698.80	0.00	0.00	0.00	0.00
16,500.00	89.83	179.76	7,552.48	-8,794.79	-265.45	8,798.75	0.00	0.00	0.00	0.00
16,600.00	89.83	179.76	7,552.77	-8,894.79	-265.03	8,898.70	0.00	0.00	0.00	0.00
16,700.00	89.83	179.76	7,553.07	-8,994.79	-264.61	8,998.65	0.00	0.00	0.00	0.00
16,800.00	89.83	179.76	7,553.36	-9,094.78	-264.18	9,098.60	0.00	0.00	0.00	0.00
16,900.00	89.83	179.76	7,553.66	-9,194.78	-263.76	9,198.55	0.00	0.00	0.00	0.00
17,000.00	89.83	179.76	7,553.96	-9,294.78	-263.33	9,298.50	0.00	0.00	0.00	0.00
17,100.00	89.83	179.76	7,554.25	-9,394.78	-262.91	9,398.45	0.00	0.00	0.00	0.00
17,200.00	89.83	179.76	7,554.55	-9,494.78	-262.49	9,498.40	0.00	0.00	0.00	0.00
17,300.00	89.83	179.76	7,554.84	-9,594.78	-262.06	9,598.36	0.00	0.00	0.00	0.00
17,353.78	89.83	179.76	7,555.00	-9,648.56	-261.84	9,652.11	0.00	0.00	0.00	0.00
<b>Niobrara B TL (Toe)</b>										
17,353.79	89.83	179.76	7,555.00	-9,648.56	-261.84	9,652.11	0.00	0.00	0.00	0.00
<b>Griffiths 35N-20HZ_BHL</b>										

**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
400.00	400.00	0.00	0.00	Hold Angle @ 0.00
917.00	917.00	0.00	0.00	Begin Nudge @ 917.00ft
1,000.00	999.99	0.99	-0.68	Nudge Rate = 2.00/100ft
1,154.05	1,153.78	8.08	-5.55	End Nudge @ 1154.05ft
4,000.00	3,989.99	202.01	-138.67	Hold Angle @ 4.74
6,935.60	6,915.55	402.04	-275.98	Begin Build @ 6935.60ft
7,400.00	7,341.48	252.63	-295.19	Build Rate = 10.00/100ft
7,873.10	7,527.00	-168.00	-302.00	End Build @ 7873.10ft
12,000.00	7,539.19	-4,294.85	-284.52	Hold Angle @ 89.83
17,353.79	7,555.00	-9,648.57	-261.84	Total Depth @ 17353.79ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/_S (ft)	+E/-W (ft)	
Target	Griffiths 35N-20HZ_BHL	181.55	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	17,353.79	Plan A Rev 0 Permit	MWD

**Plan Report for Griffiths 35N-20HZ - Plan A Rev 0 Permit****Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,873.10	7,527.00	7" Intermediate Casing	7	8-3/4

**Formation Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,566.95	4,555.00	Sussex		0.00	
5,159.98	5,146.00	Shannon		0.00	
7,456.30	7,381.00	Niobrara A		0.00	
7,501.88	7,410.00	Sharon Springs		0.00	
7,715.41	7,505.00	Niobrara B		0.00	
7,873.10	7,527.00	Niobrara B TL (Heel)		0.00	
17,353.78	7,555.00	Niobrara B TL (Toe)		0.00	

***Targets associated with this wellbore***

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Griffiths 35N-20HZ_Section Line	0.00	0.00	0.00	Polygon
Griffiths 35N-20HZ_BHL	7,555.00	-9,648.56	-261.84	Point
Griffiths 35N-20HZ_SHL	0.00	0.00	0.00	Point
Griffiths 35N-20HZ_Setback Line	0.00	0.00	0.00	Polygon
Griffiths 35N-20HZ_Casing Point	7,527.00	-168.00	-302.00	Point

## North Reference Sheet for Sec. 17-T1N-R67W - Griffiths 35N-20HZ - 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 @ 5073.00ft (Drilling Rig). Northing and Easting are relative to Griffiths 35N-20HZ

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: 0.99996253

Grid Coordinates of Well: 1,264,173.58 ft N, 3,163,028.48 ft E

Geographical Coordinates of Well: 40° 03' 25.47" N, 104° 55' 03.30" W

Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,353.79ft  
the Bottom Hole Displacement is 9,652.11ft in the Direction of 181.55° (True).

Magnetic Convergence at surface is: -8.37° (30 August 2012, , BGGM2011)

