

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 17-T1N-R67W

Griffiths 13N-20HZ

Plan B Rev 0

Plan: Plan B Rev 0 Permit

Sperry Drilling Services

Proposal Report

12 December, 2012

Well Coordinates: 1,264,176.36 N, 3,161,951.59 E (40° 03' 25.57" N, 104° 55' 17.15" W)

Ground Level: 5,070.00 ft

Local Coordinate Origin:

Centered on Well Griffiths 13N-20HZ

Viewing Datum:

RKB=17 @ 5087.00ft (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 13N-20HZ
Wellbore: Plan B Rev 0
Design: Plan B Rev 0 Permit

Anadarko Petroleum Corp.

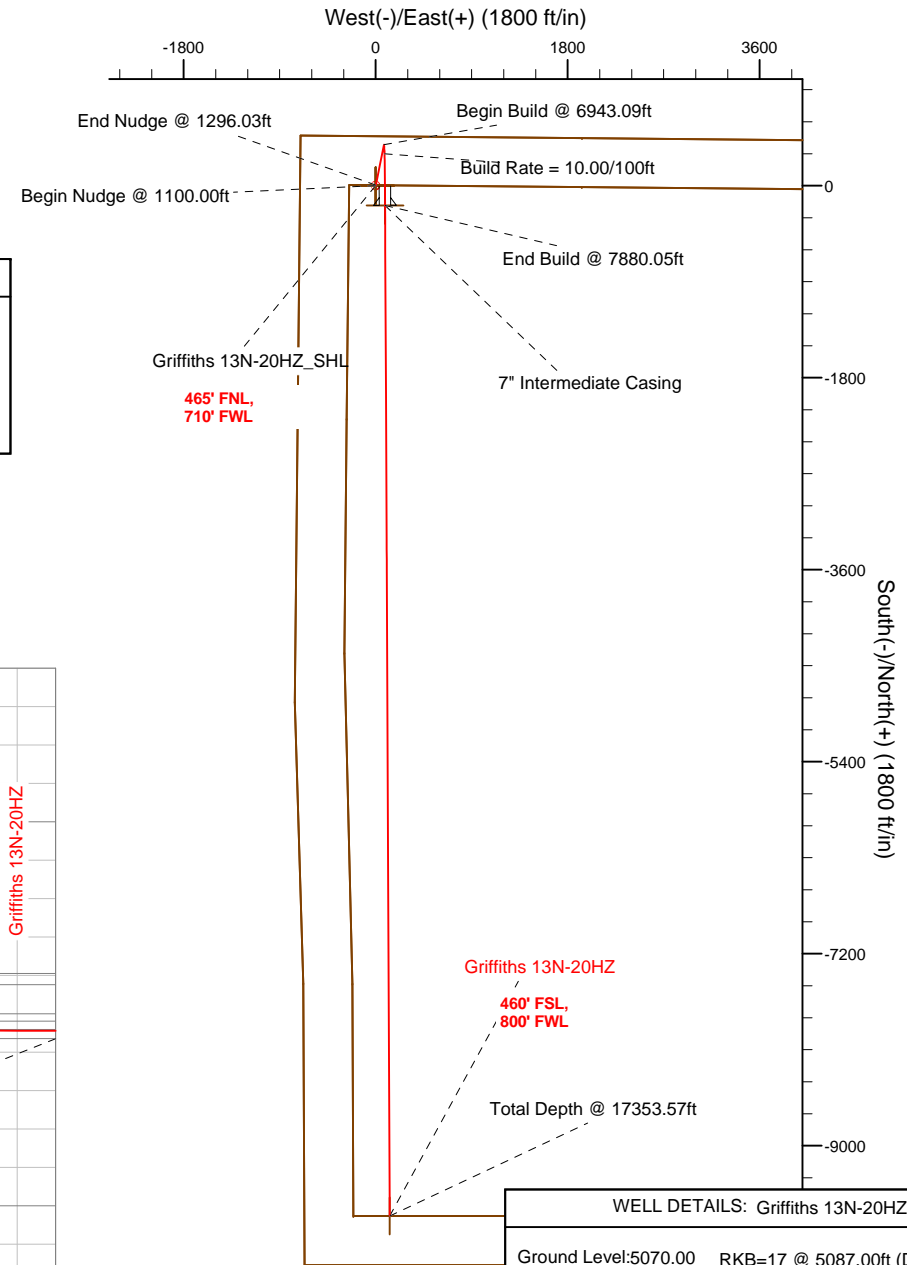
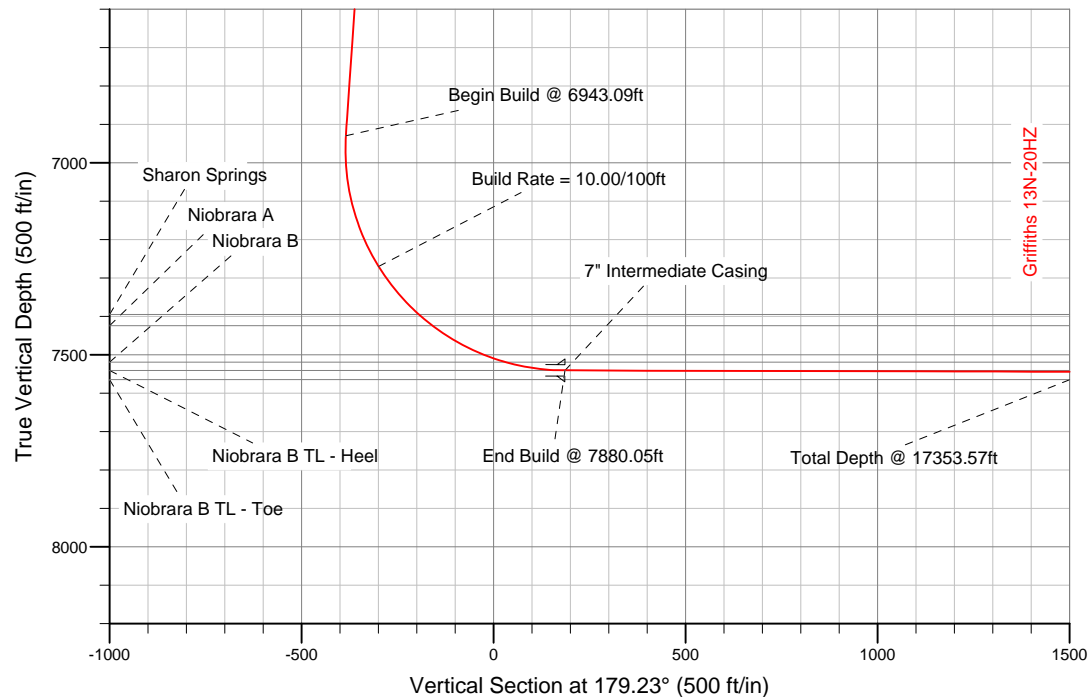
HALLIBURTON
Sperry Drilling

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	1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	
3	1296.03	3.92	11.31	1295.87	6.57	1.32	2.00	11.31	-6.56	
4	6943.09	3.92	11.31	6929.72	385.18	77.06	0.00	0.00	-384.10	
5	7880.05	89.85	179.74	7541.00	-185.00	88.00	10.00	168.40	186.17	Griffiths 13N-20HZ_CP
6	17353.57	89.85	179.74	7565.00	-9658.39	130.50	0.00	0.00	9659.28	Griffiths 13N-20HZ_newBHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Griffiths 13N-20HZ_Sec 17/20 Line	0.00	0.00	0.00	40.057103	-104.921430	Point
Griffiths 13N-20HZ_Section Line	0.00	0.00	0.00	40.057103	-104.921430	Polygon
Griffiths 13N-20HZ_Setback Line	0.00	0.00	0.00	40.057103	-104.921430	Polygon
Griffiths 13N-20HZ_SHL	0.00	0.00	0.00	40.057103	-104.921430	Point
Griffiths 13N-20HZ_CP	7541.00	-185.00	88.00	40.056595	-104.921116	Point
Griffiths 13N-20HZ_newBHL	7565.00	-9658.39	130.50	40.030590	-104.920964	Point



WELL DETAILS: Griffiths 13N-20HZ

Ground Level: 5070.00 RKB=17 @ 5087.00ft (Drilling Rig)

Plan: Plan B Rev 0 Permit (Griffiths 13N-20HZ/Plan B Rev 0)

Created By: Fred Hartmann Date: 12/03/2012
Reviewed: _____ Date: _____

Plan Report for Griffiths 13N-20HZ - Plan B 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
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
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	11.31	1,199.98	1.71	0.34	-1.71	2.00	2.00	0.00	11.31
1,296.03	3.92	11.31	1,295.88	6.57	1.32	-6.56	2.00	2.00	0.00	0.00
End Nudge @ 1296.03ft										
1,300.00	3.92	11.31	1,299.84	6.84	1.37	-6.82	0.00	0.00	0.00	0.00
1,400.00	3.92	11.31	1,399.60	13.54	2.71	-13.51	0.00	0.00	0.00	0.00
1,500.00	3.92	11.31	1,499.37	20.25	4.05	-20.19	0.00	0.00	0.00	0.00
1,600.00	3.92	11.31	1,599.14	26.95	5.39	-26.88	0.00	0.00	0.00	0.00
1,700.00	3.92	11.31	1,698.90	33.66	6.73	-33.56	0.00	0.00	0.00	0.00
1,800.00	3.92	11.31	1,798.67	40.36	8.08	-40.25	0.00	0.00	0.00	0.00
1,900.00	3.92	11.31	1,898.43	47.07	9.42	-46.94	0.00	0.00	0.00	0.00
2,000.00	3.92	11.31	1,998.20	53.77	10.76	-53.62	0.00	0.00	0.00	0.00
2,100.00	3.92	11.31	2,097.97	60.48	12.10	-60.31	0.00	0.00	0.00	0.00
2,200.00	3.92	11.31	2,197.73	67.18	13.44	-66.99	0.00	0.00	0.00	0.00
2,300.00	3.92	11.31	2,297.50	73.88	14.78	-73.68	0.00	0.00	0.00	0.00
2,400.00	3.92	11.31	2,397.26	80.59	16.12	-80.36	0.00	0.00	0.00	0.00
2,500.00	3.92	11.31	2,497.03	87.29	17.46	-87.05	0.00	0.00	0.00	0.00
2,600.00	3.92	11.31	2,596.80	94.00	18.81	-93.73	0.00	0.00	0.00	0.00
2,700.00	3.92	11.31	2,696.56	100.70	20.15	-100.42	0.00	0.00	0.00	0.00
2,800.00	3.92	11.31	2,796.33	107.41	21.49	-107.11	0.00	0.00	0.00	0.00
2,900.00	3.92	11.31	2,896.09	114.11	22.83	-113.79	0.00	0.00	0.00	0.00
3,000.00	3.92	11.31	2,995.86	120.82	24.17	-120.48	0.00	0.00	0.00	0.00
3,100.00	3.92	11.31	3,095.63	127.52	25.51	-127.16	0.00	0.00	0.00	0.00
3,200.00	3.92	11.31	3,195.39	134.22	26.85	-133.85	0.00	0.00	0.00	0.00
3,300.00	3.92	11.31	3,295.16	140.93	28.20	-140.53	0.00	0.00	0.00	0.00
3,400.00	3.92	11.31	3,394.92	147.63	29.54	-147.22	0.00	0.00	0.00	0.00
3,500.00	3.92	11.31	3,494.69	154.34	30.88	-153.91	0.00	0.00	0.00	0.00
3,600.00	3.92	11.31	3,594.46	161.04	32.22	-160.59	0.00	0.00	0.00	0.00
3,700.00	3.92	11.31	3,694.22	167.75	33.56	-167.28	0.00	0.00	0.00	0.00
3,800.00	3.92	11.31	3,793.99	174.45	34.90	-173.96	0.00	0.00	0.00	0.00
3,900.00	3.92	11.31	3,893.75	181.15	36.24	-180.65	0.00	0.00	0.00	0.00
4,000.00	3.92	11.31	3,993.52	187.86	37.58	-187.33	0.00	0.00	0.00	0.00
4,100.00	3.92	11.31	4,093.29	194.56	38.93	-194.02	0.00	0.00	0.00	0.00
4,200.00	3.92	11.31	4,193.05	201.27	40.27	-200.71	0.00	0.00	0.00	0.00
4,300.00	3.92	11.31	4,292.82	207.97	41.61	-207.39	0.00	0.00	0.00	0.00
4,400.00	3.92	11.31	4,392.58	214.68	42.95	-214.08	0.00	0.00	0.00	0.00
4,500.00	3.92	11.31	4,492.35	221.38	44.29	-220.76	0.00	0.00	0.00	0.00
4,576.83	3.92	11.31	4,569.00	226.53	45.32	-225.90	0.00	0.00	0.00	0.00
Sussex										
4,600.00	3.92	11.31	4,592.12	228.09	45.63	-227.45	0.00	0.00	0.00	0.00
4,700.00	3.92	11.31	4,691.88	234.79	46.97	-234.13	0.00	0.00	0.00	0.00
4,800.00	3.92	11.31	4,791.65	241.49	48.31	-240.82	0.00	0.00	0.00	0.00
4,900.00	3.92	11.31	4,891.41	248.20	49.66	-247.51	0.00	0.00	0.00	0.00
5,000.00	3.92	11.31	4,991.18	254.90	51.00	-254.19	0.00	0.00	0.00	0.00
5,100.00	3.92	11.31	5,090.95	261.61	52.34	-260.88	0.00	0.00	0.00	0.00
5,169.22	3.92	11.31	5,160.00	266.25	53.27	-265.50	0.00	0.00	0.00	0.00

Plan Report for Griffiths 13N-20HZ - Plan B 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 (°)
Shannon										
5,200.00	3.92	11.31	5,190.71	268.31	53.68	-267.56	0.00	0.00	0.00	0.00
5,300.00	3.92	11.31	5,290.48	275.02	55.02	-274.25	0.00	0.00	0.00	0.00
5,400.00	3.92	11.31	5,390.24	281.72	56.36	-280.93	0.00	0.00	0.00	0.00
5,500.00	3.92	11.31	5,490.01	288.43	57.70	-287.62	0.00	0.00	0.00	0.00
5,600.00	3.92	11.31	5,589.78	295.13	59.05	-294.31	0.00	0.00	0.00	0.00
5,700.00	3.92	11.31	5,689.54	301.83	60.39	-300.99	0.00	0.00	0.00	0.00
5,800.00	3.92	11.31	5,789.31	308.54	61.73	-307.68	0.00	0.00	0.00	0.00
5,900.00	3.92	11.31	5,889.07	315.24	63.07	-314.36	0.00	0.00	0.00	0.00
6,000.00	3.92	11.31	5,988.84	321.95	64.41	-321.05	0.00	0.00	0.00	0.00
6,100.00	3.92	11.31	6,088.61	328.65	65.75	-327.73	0.00	0.00	0.00	0.00
6,200.00	3.92	11.31	6,188.37	335.36	67.09	-334.42	0.00	0.00	0.00	0.00
6,300.00	3.92	11.31	6,288.14	342.06	68.43	-341.11	0.00	0.00	0.00	0.00
6,400.00	3.92	11.31	6,387.90	348.77	69.78	-347.79	0.00	0.00	0.00	0.00
6,500.00	3.92	11.31	6,487.67	355.47	71.12	-354.48	0.00	0.00	0.00	0.00
6,600.00	3.92	11.31	6,587.43	362.17	72.46	-361.16	0.00	0.00	0.00	0.00
6,700.00	3.92	11.31	6,687.20	368.88	73.80	-367.85	0.00	0.00	0.00	0.00
6,800.00	3.92	11.31	6,786.97	375.58	75.14	-374.53	0.00	0.00	0.00	0.00
6,900.00	3.92	11.31	6,886.73	382.29	76.48	-381.22	0.00	0.00	0.00	0.00
6,943.09	3.92	11.31	6,929.72	385.18	77.06	-384.10	0.00	0.00	0.00	0.00
Begin Build @ 6943.09ft										
7,000.00	2.01	156.70	6,986.59	386.17	77.84	-385.08	10.00	-3.36	255.46	168.40
7,100.00	11.88	176.00	7,085.75	374.26	79.25	-373.16	10.00	9.87	19.30	23.06
7,200.00	21.86	177.78	7,181.32	345.32	80.70	-344.20	10.00	9.99	1.78	3.83
7,300.00	31.86	178.48	7,270.42	300.22	82.12	-299.08	10.00	10.00	0.70	2.11
Build Rate = 10.00/100ft										
7,400.00	41.86	178.87	7,350.33	240.32	83.49	-239.17	10.00	10.00	0.39	1.49
7,463.22	48.18	179.04	7,395.00	195.64	84.30	-194.48	10.00	10.00	0.28	1.18
Sharon Springs										
7,500.00	51.85	179.13	7,418.63	167.47	84.75	-166.30	10.00	10.00	0.23	1.06
7,508.78	52.73	179.15	7,424.00	160.52	84.85	-159.36	10.00	10.00	0.22	1.00
Niobrara A										
7,600.00	61.85	179.32	7,473.24	83.85	85.87	-82.68	10.00	10.00	0.20	0.99
7,700.00	71.85	179.49	7,512.50	-7.98	86.82	9.15	10.00	10.00	0.16	0.89
7,722.19	74.07	179.52	7,519.00	-29.20	87.00	30.37	10.00	10.00	0.15	0.83
Niobrara B										
7,800.00	81.85	179.63	7,535.22	-105.23	87.57	106.40	10.00	10.00	0.14	0.82
7,880.05	89.85	179.74	7,541.00	-185.00	88.00	186.17	10.00	10.00	0.14	0.80
End Build @ 7880.05ft - Niobrara B TL - Heel - 7" Intermediate Casing - Griffiths 13N-20HZ_CP										
7,900.00	89.85	179.74	7,541.05	-204.95	88.09	206.12	0.00	0.00	0.00	0.79
8,000.00	89.85	179.74	7,541.30	-304.95	88.54	306.12	0.00	0.00	0.00	0.00
8,100.00	89.85	179.74	7,541.56	-404.95	88.99	406.12	0.00	0.00	0.00	0.00
8,200.00	89.85	179.74	7,541.81	-504.95	89.44	506.11	0.00	0.00	0.00	0.00
8,300.00	89.85	179.74	7,542.06	-604.95	89.88	606.11	0.00	0.00	0.00	0.00
8,400.00	89.85	179.74	7,542.32	-704.95	90.33	706.10	0.00	0.00	0.00	0.00
8,500.00	89.85	179.74	7,542.57	-804.94	90.78	806.10	0.00	0.00	0.00	0.00
8,600.00	89.85	179.74	7,542.82	-904.94	91.23	906.09	0.00	0.00	0.00	0.00
8,700.00	89.85	179.74	7,543.08	-1,004.94	91.68	1,006.09	0.00	0.00	0.00	0.00
8,800.00	89.85	179.74	7,543.33	-1,104.94	92.13	1,106.08	0.00	0.00	0.00	0.00
8,900.00	89.85	179.74	7,543.58	-1,204.94	92.58	1,206.08	0.00	0.00	0.00	0.00
9,000.00	89.85	179.74	7,543.84	-1,304.94	93.02	1,306.08	0.00	0.00	0.00	0.00
9,100.00	89.85	179.74	7,544.09	-1,404.94	93.47	1,406.07	0.00	0.00	0.00	0.00
9,200.00	89.85	179.74	7,544.34	-1,504.94	93.92	1,506.07	0.00	0.00	0.00	0.00
9,300.00	89.85	179.74	7,544.60	-1,604.93	94.37	1,606.06	0.00	0.00	0.00	0.00
9,400.00	89.85	179.74	7,544.85	-1,704.93	94.82	1,706.06	0.00	0.00	0.00	0.00
9,500.00	89.85	179.74	7,545.10	-1,804.93	95.27	1,806.05	0.00	0.00	0.00	0.00
9,600.00	89.85	179.74	7,545.36	-1,904.93	95.72	1,906.05	0.00	0.00	0.00	0.00
9,700.00	89.85	179.74	7,545.61	-2,004.93	96.16	2,006.05	0.00	0.00	0.00	0.00

Plan Report for Griffiths 13N-20HZ - Plan B 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 (°)
9,800.00	89.85	179.74	7,545.86	-2,104.93	96.61	2,106.04	0.00	0.00	0.00	0.00
9,900.00	89.85	179.74	7,546.12	-2,204.93	97.06	2,206.04	0.00	0.00	0.00	0.00
10,000.00	89.85	179.74	7,546.37	-2,304.93	97.51	2,306.03	0.00	0.00	0.00	0.00
10,100.00	89.85	179.74	7,546.62	-2,404.92	97.96	2,406.03	0.00	0.00	0.00	0.00
10,200.00	89.85	179.74	7,546.88	-2,504.92	98.41	2,506.02	0.00	0.00	0.00	0.00
10,300.00	89.85	179.74	7,547.13	-2,604.92	98.86	2,606.02	0.00	0.00	0.00	0.00
10,400.00	89.85	179.74	7,547.38	-2,704.92	99.30	2,706.01	0.00	0.00	0.00	0.00
10,500.00	89.85	179.74	7,547.64	-2,804.92	99.75	2,806.01	0.00	0.00	0.00	0.00
10,600.00	89.85	179.74	7,547.89	-2,904.92	100.20	2,906.01	0.00	0.00	0.00	0.00
10,700.00	89.85	179.74	7,548.14	-3,004.92	100.65	3,006.00	0.00	0.00	0.00	0.00
10,800.00	89.85	179.74	7,548.40	-3,104.91	101.10	3,106.00	0.00	0.00	0.00	0.00
10,900.00	89.85	179.74	7,548.65	-3,204.91	101.55	3,205.99	0.00	0.00	0.00	0.00
11,000.00	89.85	179.74	7,548.90	-3,304.91	102.00	3,305.99	0.00	0.00	0.00	0.00
11,100.00	89.85	179.74	7,549.16	-3,404.91	102.44	3,405.98	0.00	0.00	0.00	0.00
11,200.00	89.85	179.74	7,549.41	-3,504.91	102.89	3,505.98	0.00	0.00	0.00	0.00
11,300.00	89.85	179.74	7,549.66	-3,604.91	103.34	3,605.97	0.00	0.00	0.00	0.00
11,400.00	89.85	179.74	7,549.92	-3,704.91	103.79	3,705.97	0.00	0.00	0.00	0.00
11,500.00	89.85	179.74	7,550.17	-3,804.91	104.24	3,805.97	0.00	0.00	0.00	0.00
11,600.00	89.85	179.74	7,550.42	-3,904.90	104.69	3,905.96	0.00	0.00	0.00	0.00
11,700.00	89.85	179.74	7,550.68	-4,004.90	105.14	4,005.96	0.00	0.00	0.00	0.00
11,800.00	89.85	179.74	7,550.93	-4,104.90	105.58	4,105.95	0.00	0.00	0.00	0.00
11,900.00	89.85	179.74	7,551.18	-4,204.90	106.03	4,205.95	0.00	0.00	0.00	0.00
12,000.00	89.85	179.74	7,551.44	-4,304.90	106.48	4,305.94	0.00	0.00	0.00	0.00
12,100.00	89.85	179.74	7,551.69	-4,404.90	106.93	4,405.94	0.00	0.00	0.00	0.00
12,200.00	89.85	179.74	7,551.94	-4,504.90	107.38	4,505.94	0.00	0.00	0.00	0.00
12,300.00	89.85	179.74	7,552.20	-4,604.89	107.83	4,605.93	0.00	0.00	0.00	0.00
12,400.00	89.85	179.74	7,552.45	-4,704.89	108.28	4,705.93	0.00	0.00	0.00	0.00
12,500.00	89.85	179.74	7,552.70	-4,804.89	108.72	4,805.92	0.00	0.00	0.00	0.00
12,600.00	89.85	179.74	7,552.96	-4,904.89	109.17	4,905.92	0.00	0.00	0.00	0.00
12,700.00	89.85	179.74	7,553.21	-5,004.89	109.62	5,005.91	0.00	0.00	0.00	0.00
12,800.00	89.85	179.74	7,553.46	-5,104.89	110.07	5,105.91	0.00	0.00	0.00	0.00
12,900.00	89.85	179.74	7,553.72	-5,204.89	110.52	5,205.90	0.00	0.00	0.00	0.00
13,000.00	89.85	179.74	7,553.97	-5,304.89	110.97	5,305.90	0.00	0.00	0.00	0.00
13,100.00	89.85	179.74	7,554.22	-5,404.88	111.42	5,405.90	0.00	0.00	0.00	0.00
13,200.00	89.85	179.74	7,554.48	-5,504.88	111.87	5,505.89	0.00	0.00	0.00	0.00
13,300.00	89.85	179.74	7,554.73	-5,604.88	112.31	5,605.89	0.00	0.00	0.00	0.00
13,400.00	89.85	179.74	7,554.98	-5,704.88	112.76	5,705.88	0.00	0.00	0.00	0.00
13,500.00	89.85	179.74	7,555.24	-5,804.88	113.21	5,805.88	0.00	0.00	0.00	0.00
13,600.00	89.85	179.74	7,555.49	-5,904.88	113.66	5,905.87	0.00	0.00	0.00	0.00
13,700.00	89.85	179.74	7,555.74	-6,004.88	114.11	6,005.87	0.00	0.00	0.00	0.00
13,800.00	89.85	179.74	7,556.00	-6,104.87	114.56	6,105.87	0.00	0.00	0.00	0.00
13,900.00	89.85	179.74	7,556.25	-6,204.87	115.01	6,205.86	0.00	0.00	0.00	0.00
14,000.00	89.85	179.74	7,556.50	-6,304.87	115.45	6,305.86	0.00	0.00	0.00	0.00
14,100.00	89.85	179.74	7,556.76	-6,404.87	115.90	6,405.85	0.00	0.00	0.00	0.00
14,200.00	89.85	179.74	7,557.01	-6,504.87	116.35	6,505.85	0.00	0.00	0.00	0.00
14,300.00	89.85	179.74	7,557.26	-6,604.87	116.80	6,605.84	0.00	0.00	0.00	0.00
14,400.00	89.85	179.74	7,557.52	-6,704.87	117.25	6,705.84	0.00	0.00	0.00	0.00
14,500.00	89.85	179.74	7,557.77	-6,804.87	117.70	6,805.83	0.00	0.00	0.00	0.00
14,600.00	89.85	179.74	7,558.02	-6,904.86	118.15	6,905.83	0.00	0.00	0.00	0.00
14,700.00	89.85	179.74	7,558.28	-7,004.86	118.59	7,005.83	0.00	0.00	0.00	0.00
14,800.00	89.85	179.74	7,558.53	-7,104.86	119.04	7,105.82	0.00	0.00	0.00	0.00
14,900.00	89.85	179.74	7,558.78	-7,204.86	119.49	7,205.82	0.00	0.00	0.00	0.00
15,000.00	89.85	179.74	7,559.04	-7,304.86	119.94	7,305.81	0.00	0.00	0.00	0.00
15,100.00	89.85	179.74	7,559.29	-7,404.86	120.39	7,405.81	0.00	0.00	0.00	0.00
15,200.00	89.85	179.74	7,559.54	-7,504.86	120.84	7,505.80	0.00	0.00	0.00	0.00
15,300.00	89.85	179.74	7,559.80	-7,604.85	121.29	7,605.80	0.00	0.00	0.00	0.00
15,400.00	89.85	179.74	7,560.05	-7,704.85	121.73	7,705.79	0.00	0.00	0.00	0.00
15,500.00	89.85	179.74	7,560.30	-7,804.85	122.18	7,805.79	0.00	0.00	0.00	0.00
15,600.00	89.85	179.74	7,560.56	-7,904.85	122.63	7,905.79	0.00	0.00	0.00	0.00
15,700.00	89.85	179.74	7,560.81	-8,004.85	123.08	8,005.78	0.00	0.00	0.00	0.00

Plan Report for Griffiths 13N-20HZ - Plan B 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 (°)
15,800.00	89.85	179.74	7,561.06	-8,104.85	123.53	8,105.78	0.00	0.00	0.00	0.00
15,900.00	89.85	179.74	7,561.32	-8,204.85	123.98	8,205.77	0.00	0.00	0.00	0.00
16,000.00	89.85	179.74	7,561.57	-8,304.85	124.43	8,305.77	0.00	0.00	0.00	0.00
16,100.00	89.85	179.74	7,561.82	-8,404.84	124.87	8,405.76	0.00	0.00	0.00	0.00
16,200.00	89.85	179.74	7,562.08	-8,504.84	125.32	8,505.76	0.00	0.00	0.00	0.00
16,300.00	89.85	179.74	7,562.33	-8,604.84	125.77	8,605.76	0.00	0.00	0.00	0.00
16,400.00	89.85	179.74	7,562.58	-8,704.84	126.22	8,705.75	0.00	0.00	0.00	0.00
16,500.00	89.85	179.74	7,562.84	-8,804.84	126.67	8,805.75	0.00	0.00	0.00	0.00
16,600.00	89.85	179.74	7,563.09	-8,904.84	127.12	8,905.74	0.00	0.00	0.00	0.00
16,700.00	89.85	179.74	7,563.34	-9,004.84	127.57	9,005.74	0.00	0.00	0.00	0.00
16,800.00	89.85	179.74	7,563.60	-9,104.83	128.01	9,105.73	0.00	0.00	0.00	0.00
16,900.00	89.85	179.74	7,563.85	-9,204.83	128.46	9,205.73	0.00	0.00	0.00	0.00
17,000.00	89.85	179.74	7,564.10	-9,304.83	128.91	9,305.72	0.00	0.00	0.00	0.00
17,100.00	89.85	179.74	7,564.36	-9,404.83	129.36	9,405.72	0.00	0.00	0.00	0.00
17,200.00	89.85	179.74	7,564.61	-9,504.83	129.81	9,505.72	0.00	0.00	0.00	0.00
17,300.00	89.85	179.74	7,564.86	-9,604.83	130.26	9,605.71	0.00	0.00	0.00	0.00
17,353.56	89.85	179.74	7,565.00	-9,658.39	130.50	9,659.27	0.00	0.00	0.00	0.00
Niobrara B TL - Toe										
17,353.57	89.85	179.74	7,565.00	-9,658.39	130.50	9,659.28	0.00	0.00	0.00	0.00
Griffiths 13N-20HZ_newBHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N-S (ft)	+E-W (ft)	Comment
1,100.00	1,100.00	0.00	0.00	Begin Nudge @ 1100.00ft
1,296.03	1,295.88	6.57	1.32	End Nudge @ 1296.03ft
6,943.09	6,929.72	385.18	77.06	Begin Build @ 6943.09ft
7,300.00	7,270.42	300.22	82.12	Build Rate = 10.00/100ft
7,880.05	7,541.00	-185.00	88.00	End Build @ 7880.05ft
17,353.57	7,565.00	-9,658.40	130.50	Total Depth @ 17353.57ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N-S (ft)	+E-W (ft)	Start TVD (ft)
Target	Griffiths 13N-20HZ_newBHL	179.23	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	17,353.57	Plan B Rev 0 Permit	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,880.05	7,541.00	7" Intermediate Casing	7	8-3/4

Plan Report for Griffiths 13N-20HZ - Plan B Rev 0 Permit

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,576.83	4,569.00	Sussex		0.00	
5,169.22	5,160.00	Shannon		0.00	
7,463.22	7,395.00	Sharon Springs		0.00	
7,508.78	7,424.00	Niobrara A		0.00	
7,722.19	7,519.00	Niobrara B		0.00	
7,880.05	7,541.00	Niobrara B TL - Heel		0.00	
17,353.56	7,565.00	Niobrara B TL - Toe		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Griffiths 13N-20HZ_Section Line	0.00	0.00	0.00	Polygon
Griffiths 13N-20HZ_Setback Line	0.00	0.00	0.00	Polygon
Griffiths 13N-20HZ_SHL	0.00	0.00	0.00	Point
Griffiths 13N-20HZ_Sec 17/20 Line	0.00	0.00	0.00	Point
Griffiths 13N-20HZ_newBHL	7,565.00	-9,658.39	130.50	Point
Griffiths 13N-20HZ_CP	7,541.00	-185.00	88.00	Point

North Reference Sheet for Sec. 17-T1N-R67W - Griffiths 13N-20HZ - Plan B 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 @ 5087.00ft (Drilling Rig). Northing and Easting are relative to Griffiths 13N-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: 1,264,176.36 ft N, 3,161,951.59 ft E

Geographical Coordinates of Well: 40° 03' 25.57" N, 104° 55' 17.15" W

Grid Convergence at Surface is: 0.37°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,353.57ft
the Bottom Hole Displacement is 9,659.28ft in the Direction of 179.23° (True).

Magnetic Convergence at surface is: -8.39° (12 December 2012, , BGGM2012)

