

# Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 21-T1N-R67W

Howard 29C-21HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

## Sperry Drilling Services Proposal Report

28 December, 2012

Well Coordinates: 1,254,587.68 N, 3,168,142.69 E (40° 01' 50.40" N, 104° 53' 58.36" W)

Ground Level: 5,026.00 ft

Local Coordinate Origin:

Centered on Well Howard 29C-21HZ

Viewing Datum:

RKB=17 @ 5043.00ft (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. 21-T1N-R67W

Well: Howard 29C-21HZ

Wellbore: Plan A Rev 0

Design: Plan A Rev 0 Permit

# Anadarko Petroleum Corp.

HALLIBURTON

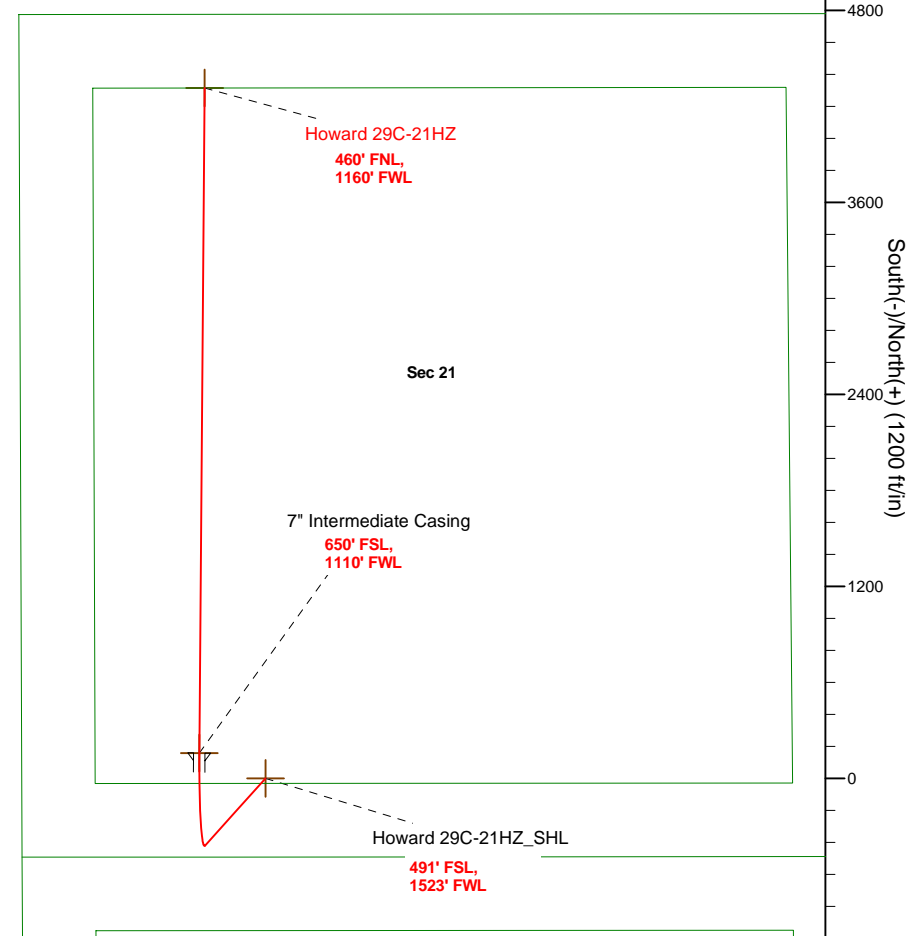
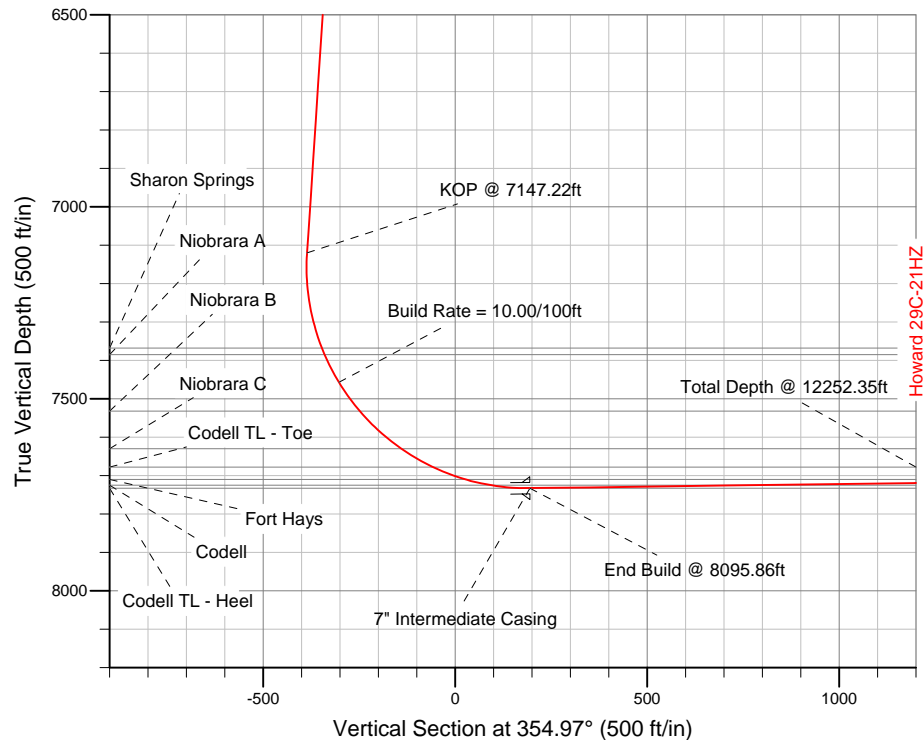
Sperry Drilling

## 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	1100.00	0.00	0.00	1100.00	0.00	0.00	0.00	0.00	0.00	
3	1374.46	5.49	221.97	1374.04	-9.77	-8.79	2.00	221.97	-8.96	
4	7147.22	5.49	221.97	7120.33	-420.35	-378.06	0.00	0.00	-385.57	
5	8095.86	90.76	0.46	7733.00	159.00	-413.00	10.00	138.31	194.61	Howard 29C-21HZ_CP
6	12252.35	90.76	0.46	7678.00	4315.00	-379.95	0.00	0.00	4331.69	Howard 29C-21HZ_BHL

## WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Howard 29C-21HZ_SHL	0.00	0.00	0.00	40.030668	-104.899545	Point
Howard 29C-21HZ_BHL	7678.00	4315.00	-379.95	40.042513	-104.900902	Point
Howard 29C-21HZ_CP	7733.00	159.00	-413.00	40.031104	-104.901020	Point



\*Footages are calculated from SHL and assume section lines parallel N/S and E/W.

WELL DETAILS: Howard 29C-21HZ

Ground Level: 5026.00 RKB=17 @ 5043.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Howard 29C-21HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 12/28/2012  
Reviewed: \_\_\_\_\_ Date: \_\_\_\_\_

**Plan Report for Howard 29C-21HZ - 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
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
<b>Begin Nudge @ 1100.00ft</b>										
1,200.00	2.00	221.97	1,199.98	-1.30	-1.17	-1.19	2.00	2.00	0.00	221.97
1,300.00	4.00	221.97	1,299.84	-5.19	-4.67	-4.76	2.00	2.00	0.00	0.00
1,374.46	5.49	221.97	1,374.04	-9.77	-8.79	-8.96	2.00	2.00	0.00	0.00
<b>End Nudge @ 1374.46ft</b>										
1,400.00	5.49	221.97	1,399.46	-11.58	-10.42	-10.63	0.00	0.00	0.00	0.00
1,500.00	5.49	221.97	1,499.00	-18.70	-16.82	-17.15	0.00	0.00	0.00	0.00
1,600.00	5.49	221.97	1,598.55	-25.81	-23.21	-23.67	0.00	0.00	0.00	0.00
1,700.00	5.49	221.97	1,698.09	-32.92	-29.61	-30.20	0.00	0.00	0.00	0.00
1,800.00	5.49	221.97	1,797.63	-40.03	-36.01	-36.72	0.00	0.00	0.00	0.00
1,900.00	5.49	221.97	1,897.17	-47.15	-42.40	-43.25	0.00	0.00	0.00	0.00
2,000.00	5.49	221.97	1,996.71	-54.26	-48.80	-49.77	0.00	0.00	0.00	0.00
2,100.00	5.49	221.97	2,096.25	-61.37	-55.20	-56.29	0.00	0.00	0.00	0.00
2,200.00	5.49	221.97	2,195.79	-68.48	-61.59	-62.82	0.00	0.00	0.00	0.00
2,300.00	5.49	221.97	2,295.34	-75.60	-67.99	-69.34	0.00	0.00	0.00	0.00
2,400.00	5.49	221.97	2,394.88	-82.71	-74.39	-75.86	0.00	0.00	0.00	0.00
2,500.00	5.49	221.97	2,494.42	-89.82	-80.78	-82.39	0.00	0.00	0.00	0.00
2,600.00	5.49	221.97	2,593.96	-96.93	-87.18	-88.91	0.00	0.00	0.00	0.00
2,700.00	5.49	221.97	2,693.50	-104.05	-93.58	-95.44	0.00	0.00	0.00	0.00
2,800.00	5.49	221.97	2,793.04	-111.16	-99.97	-101.96	0.00	0.00	0.00	0.00
2,900.00	5.49	221.97	2,892.58	-118.27	-106.37	-108.48	0.00	0.00	0.00	0.00
3,000.00	5.49	221.97	2,992.13	-125.38	-112.77	-115.01	0.00	0.00	0.00	0.00
3,100.00	5.49	221.97	3,091.67	-132.49	-119.16	-121.53	0.00	0.00	0.00	0.00
3,200.00	5.49	221.97	3,191.21	-139.61	-125.56	-128.06	0.00	0.00	0.00	0.00
3,300.00	5.49	221.97	3,290.75	-146.72	-131.96	-134.58	0.00	0.00	0.00	0.00
3,400.00	5.49	221.97	3,390.29	-153.83	-138.36	-141.10	0.00	0.00	0.00	0.00
3,500.00	5.49	221.97	3,489.83	-160.94	-144.75	-147.63	0.00	0.00	0.00	0.00
3,600.00	5.49	221.97	3,589.37	-168.06	-151.15	-154.15	0.00	0.00	0.00	0.00
3,700.00	5.49	221.97	3,688.92	-175.17	-157.55	-160.68	0.00	0.00	0.00	0.00
3,800.00	5.49	221.97	3,788.46	-182.28	-163.94	-167.20	0.00	0.00	0.00	0.00
3,900.00	5.49	221.97	3,888.00	-189.39	-170.34	-173.72	0.00	0.00	0.00	0.00
4,000.00	5.49	221.97	3,987.54	-196.51	-176.74	-180.25	0.00	0.00	0.00	0.00
4,100.00	5.49	221.97	4,087.08	-203.62	-183.13	-186.77	0.00	0.00	0.00	0.00
4,200.00	5.49	221.97	4,186.62	-210.73	-189.53	-193.29	0.00	0.00	0.00	0.00
4,300.00	5.49	221.97	4,286.16	-217.84	-195.93	-199.82	0.00	0.00	0.00	0.00
4,400.00	5.49	221.97	4,385.71	-224.96	-202.32	-206.34	0.00	0.00	0.00	0.00
4,500.00	5.49	221.97	4,485.25	-232.07	-208.72	-212.87	0.00	0.00	0.00	0.00
4,600.00	5.49	221.97	4,584.79	-239.18	-215.12	-219.39	0.00	0.00	0.00	0.00
4,700.00	5.49	221.97	4,684.33	-246.29	-221.51	-225.91	0.00	0.00	0.00	0.00
4,758.94	5.49	221.97	4,743.00	-250.48	-225.28	-229.76	0.00	0.00	0.00	0.00
<b>Sussex</b>										
4,800.00	5.49	221.97	4,783.87	-253.41	-227.91	-232.44	0.00	0.00	0.00	0.00
4,900.00	5.49	221.97	4,883.41	-260.52	-234.31	-238.96	0.00	0.00	0.00	0.00
5,000.00	5.49	221.97	4,982.95	-267.63	-240.70	-245.49	0.00	0.00	0.00	0.00
5,100.00	5.49	221.97	5,082.50	-274.74	-247.10	-252.01	0.00	0.00	0.00	0.00
5,200.00	5.49	221.97	5,182.04	-281.85	-253.50	-258.53	0.00	0.00	0.00	0.00

**Plan Report for Howard 29C-21HZ - 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 (°)
5,300.00	5.49	221.97	5,281.58	-288.97	-259.89	-265.06	0.00	0.00	0.00	0.00
5,400.00	5.49	221.97	5,381.12	-296.08	-266.29	-271.58	0.00	0.00	0.00	0.00
5,500.00	5.49	221.97	5,480.66	-303.19	-272.69	-278.10	0.00	0.00	0.00	0.00
5,600.00	5.49	221.97	5,580.20	-310.30	-279.09	-284.63	0.00	0.00	0.00	0.00
5,700.00	5.49	221.97	5,679.74	-317.42	-285.48	-291.15	0.00	0.00	0.00	0.00
5,800.00	5.49	221.97	5,779.29	-324.53	-291.88	-297.68	0.00	0.00	0.00	0.00
5,900.00	5.49	221.97	5,878.83	-331.64	-298.28	-304.20	0.00	0.00	0.00	0.00
6,000.00	5.49	221.97	5,978.37	-338.75	-304.67	-310.72	0.00	0.00	0.00	0.00
6,100.00	5.49	221.97	6,077.91	-345.87	-311.07	-317.25	0.00	0.00	0.00	0.00
6,200.00	5.49	221.97	6,177.45	-352.98	-317.47	-323.77	0.00	0.00	0.00	0.00
6,300.00	5.49	221.97	6,276.99	-360.09	-323.86	-330.30	0.00	0.00	0.00	0.00
6,400.00	5.49	221.97	6,376.53	-367.20	-330.26	-336.82	0.00	0.00	0.00	0.00
6,500.00	5.49	221.97	6,476.08	-374.32	-336.66	-343.34	0.00	0.00	0.00	0.00
6,600.00	5.49	221.97	6,575.62	-381.43	-343.05	-349.87	0.00	0.00	0.00	0.00
6,700.00	5.49	221.97	6,675.16	-388.54	-349.45	-356.39	0.00	0.00	0.00	0.00
6,800.00	5.49	221.97	6,774.70	-395.65	-355.85	-362.92	0.00	0.00	0.00	0.00
6,900.00	5.49	221.97	6,874.24	-402.77	-362.24	-369.44	0.00	0.00	0.00	0.00
7,000.00	5.49	221.97	6,973.78	-409.88	-368.64	-375.96	0.00	0.00	0.00	0.00
7,100.00	5.49	221.97	7,073.32	-416.99	-375.04	-382.49	0.00	0.00	0.00	0.00
7,147.22	5.49	221.97	7,120.33	-420.35	-378.06	-385.57	0.00	0.00	0.00	0.00
<b>KOP @ 7147.22ft</b>										
7,200.00	3.83	288.26	7,172.96	-421.67	-381.42	-386.59	10.00	-3.14	125.59	138.31
7,300.00	11.75	342.55	7,272.06	-410.89	-387.66	-375.30	10.00	7.92	54.30	72.19
7,400.00	21.47	351.08	7,367.78	-383.03	-393.57	-347.03	10.00	9.72	8.53	18.21
7,400.23	21.47	351.08	7,368.00	-382.94	-393.58	-346.94	0.00	0.00	0.00	7.61
<b>Sharon Springs</b>										
7,418.62	23.31	351.90	7,385.00	-376.01	-394.62	-339.95	10.13	9.98	4.45	10.01
<b>Niobrara A</b>										
7,500.00	31.36	354.40	7,457.23	-338.93	-398.96	-302.63	10.00	9.90	3.08	9.25
<b>Build Rate = 10.00/100ft</b>										
7,592.47	40.56	356.14	7,532.00	-284.88	-403.34	-248.40	10.00	9.94	1.87	7.02
<b>Niobrara B</b>										
7,600.00	41.31	356.25	7,537.69	-279.95	-403.67	-243.46	10.00	9.95	1.48	5.62
7,700.00	51.27	357.48	7,606.71	-207.87	-407.56	-171.32	10.00	9.96	1.23	5.53
7,738.89	55.14	357.86	7,630.00	-176.76	-408.82	-140.22	10.00	9.97	0.99	4.68
<b>Niobrara C</b>										
7,800.00	61.24	358.40	7,662.20	-124.88	-410.50	-88.39	10.00	9.97	0.88	4.45
7,900.00	71.21	359.16	7,702.46	-33.50	-412.42	2.80	10.00	9.98	0.76	4.16
7,925.02	73.71	359.34	7,710.00	-9.64	-412.73	26.60	10.00	9.98	0.70	3.85
<b>Fort Hays</b>										
7,992.01	80.39	359.79	7,725.00	55.60	-413.23	91.63	10.00	9.98	0.67	3.80
<b>Codell</b>										
8,000.00	81.19	359.84	7,726.28	63.49	-413.25	99.49	10.00	9.98	0.65	3.70
8,095.86	90.76	0.46	7,733.00	159.00	-413.00	194.61	10.00	9.98	0.64	3.69
<b>End Build @ 8095.86ft - Codell TL - Heel - 7" Intermediate Casing - Howard 29C-21HZ_CP</b>										
8,100.00	90.76	0.46	7,732.95	163.14	-412.97	198.73	0.00	0.00	0.00	3.65
8,200.00	90.76	0.46	7,731.62	263.13	-412.17	298.27	0.00	0.00	0.00	0.00
8,300.00	90.76	0.46	7,730.30	363.11	-411.38	397.80	0.00	0.00	0.00	0.00
8,400.00	90.76	0.46	7,728.98	463.10	-410.58	497.33	0.00	0.00	0.00	0.00
8,500.00	90.76	0.46	7,727.65	563.09	-409.79	596.86	0.00	0.00	0.00	0.00
8,600.00	90.76	0.46	7,726.33	663.08	-408.99	696.40	0.00	0.00	0.00	0.00
8,700.00	90.76	0.46	7,725.01	763.07	-408.20	795.93	0.00	0.00	0.00	0.00
8,800.00	90.76	0.46	7,723.68	863.06	-407.40	895.46	0.00	0.00	0.00	0.00
8,900.00	90.76	0.46	7,722.36	963.04	-406.60	995.00	0.00	0.00	0.00	0.00
9,000.00	90.76	0.46	7,721.04	1,063.03	-405.81	1,094.53	0.00	0.00	0.00	0.00
9,100.00	90.76	0.46	7,719.71	1,163.02	-405.01	1,194.06	0.00	0.00	0.00	0.00
9,200.00	90.76	0.46	7,718.39	1,263.01	-404.22	1,293.59	0.00	0.00	0.00	0.00
9,300.00	90.76	0.46	7,717.07	1,363.00	-403.42	1,393.13	0.00	0.00	0.00	0.00
9,400.00	90.76	0.46	7,715.74	1,462.98	-402.63	1,492.66	0.00	0.00	0.00	0.00

**Plan Report for Howard 29C-21HZ - 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 (°)
9,500.00	90.76	0.46	7,714.42	1,562.97	-401.83	1,592.19	0.00	0.00	0.00	0.00
9,600.00	90.76	0.46	7,713.10	1,662.96	-401.04	1,691.73	0.00	0.00	0.00	0.00
9,700.00	90.76	0.46	7,711.77	1,762.95	-400.24	1,791.26	0.00	0.00	0.00	0.00
9,800.00	90.76	0.46	7,710.45	1,862.94	-399.45	1,890.79	0.00	0.00	0.00	0.00
9,900.00	90.76	0.46	7,709.13	1,962.92	-398.65	1,990.33	0.00	0.00	0.00	0.00
10,000.00	90.76	0.46	7,707.80	2,062.91	-397.86	2,089.86	0.00	0.00	0.00	0.00
10,100.00	90.76	0.46	7,706.48	2,162.90	-397.06	2,189.39	0.00	0.00	0.00	0.00
10,200.00	90.76	0.46	7,705.16	2,262.89	-396.27	2,288.92	0.00	0.00	0.00	0.00
10,300.00	90.76	0.46	7,703.83	2,362.88	-395.47	2,388.46	0.00	0.00	0.00	0.00
10,400.00	90.76	0.46	7,702.51	2,462.86	-394.68	2,487.99	0.00	0.00	0.00	0.00
10,500.00	90.76	0.46	7,701.19	2,562.85	-393.88	2,587.52	0.00	0.00	0.00	0.00
10,600.00	90.76	0.46	7,699.86	2,662.84	-393.09	2,687.06	0.00	0.00	0.00	0.00
10,700.00	90.76	0.46	7,698.54	2,762.83	-392.29	2,786.59	0.00	0.00	0.00	0.00
10,800.00	90.76	0.46	7,697.22	2,862.82	-391.50	2,886.12	0.00	0.00	0.00	0.00
10,900.00	90.76	0.46	7,695.89	2,962.80	-390.70	2,985.66	0.00	0.00	0.00	0.00
11,000.00	90.76	0.46	7,694.57	3,062.79	-389.90	3,085.19	0.00	0.00	0.00	0.00
11,100.00	90.76	0.46	7,693.25	3,162.78	-389.11	3,184.72	0.00	0.00	0.00	0.00
11,200.00	90.76	0.46	7,691.93	3,262.77	-388.31	3,284.25	0.00	0.00	0.00	0.00
11,300.00	90.76	0.46	7,690.60	3,362.76	-387.52	3,383.79	0.00	0.00	0.00	0.00
11,400.00	90.76	0.46	7,689.28	3,462.75	-386.72	3,483.32	0.00	0.00	0.00	0.00
11,500.00	90.76	0.46	7,687.96	3,562.73	-385.93	3,582.85	0.00	0.00	0.00	0.00
11,600.00	90.76	0.46	7,686.63	3,662.72	-385.13	3,682.39	0.00	0.00	0.00	0.00
11,700.00	90.76	0.46	7,685.31	3,762.71	-384.34	3,781.92	0.00	0.00	0.00	0.00
11,800.00	90.76	0.46	7,683.99	3,862.70	-383.54	3,881.45	0.00	0.00	0.00	0.00
11,900.00	90.76	0.46	7,682.66	3,962.69	-382.75	3,980.98	0.00	0.00	0.00	0.00
12,000.00	90.76	0.46	7,681.34	4,062.67	-381.95	4,080.52	0.00	0.00	0.00	0.00
12,100.00	90.76	0.46	7,680.02	4,162.66	-381.16	4,180.05	0.00	0.00	0.00	0.00
12,200.00	90.76	0.46	7,678.69	4,262.65	-380.36	4,279.58	0.00	0.00	0.00	0.00
12,252.34	90.76	0.46	7,678.00	4,314.98	-379.95	4,331.68	0.00	0.00	0.00	0.00
<b>Codell TL - Toe</b>										
12,252.35	90.76	0.46	7,678.00	4,314.99	-379.95	4,331.69	0.01	0.00	0.00	0.00
<b>Total Depth @ 12252.35ft - Howard 29C-21HZ_BHL</b>										

**Plan Annotations**

Measured Depth (ft)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Comment
1,100.00	1,100.00	0.00	0.00	Begin Nudge @ 1100.00ft
1,374.46	1,374.04	-9.77	-8.79	End Nudge @ 1374.46ft
7,147.22	7,120.33	-420.35	-378.06	KOP @ 7147.22ft
7,500.00	7,457.23	-338.93	-398.96	Build Rate = 10.00/100ft
8,095.86	7,733.00	159.00	-413.00	End Build @ 8095.86ft
12,252.35	7,678.00	4,314.99	-379.95	Total Depth @ 12252.35ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	+N/-S (ft)	+E/-W (ft)	Start TVD (ft)
Target	Howard 29C-21HZ_BHL	354.97	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	8,095.86	Plan A Rev 0 Permit	MWD
8,095.86	12,252.35	Plan A Rev 0 Permit	MWD

**Plan Report for Howard 29C-21HZ - Plan A Rev 0 Permit****Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
8,095.86	7,733.00	7" Intermediate Casing	7	8-3/4

**Formation Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,758.94	4,743.00	Sussex		0.00	
7,400.23	7,368.00	Sharon Springs		0.00	
7,418.62	7,385.00	Niobrara A		0.00	
7,592.47	7,532.00	Niobrara B		0.00	
7,738.89	7,630.00	Niobrara C		0.00	
7,925.02	7,710.00	Fort Hays		0.00	
7,992.01	7,725.00	Codell		0.00	
8,095.86	7,733.00	Codell TL - Heel		0.00	
12,252.34	7,678.00	Codell TL - Toe		0.00	

***Targets associated with this wellbore***

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Howard 29C-21HZ_CP	7,733.00	159.00	-413.00	Point
Howard 29C-21HZ_BHL	7,678.00	4,315.00	-379.95	Point
Howard 29C-21HZ_SHL	0.00	0.00	0.00	Point

## North Reference Sheet for Sec. 21-T1N-R67W - Howard 29C-21HZ - 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 @ 5043.00ft (Drilling Rig). Northing and Easting are relative to Howard 29C-21HZ

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: 0.99996418

Grid Coordinates of Well: 1,254,587.68 ft N, 3,168,142.69 ft E

Geographical Coordinates of Well: 40° 01' 50.40" N, 104° 53' 58.36" W

Grid Convergence at Surface is: 0.39°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,252.35ft  
the Bottom Hole Displacement is 4,331.69ft in the Direction of 354.97° (True).

Magnetic Convergence at surface is: -8.36° (27 December 2012, , BGGM2012)

