

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 3-T2N-R66W

Cannon 16N-3HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

16 October, 2012

Well Coordinates: 1,306,742.73 N, 3,207,650.98 E (40° 10' 22.86" N, 104° 45' 24.85" W)

Ground Level: 5,022.00 ft

Local Coordinate Origin:	Centered on Well Cannon 16N-3HZ
Viewing Datum:	RKB=17 @ 5039.00ft (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. 3-T2N-R66W
 Well: Cannon 16N-3HZ
 Wellbore: Plan A Rev 0
 Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.



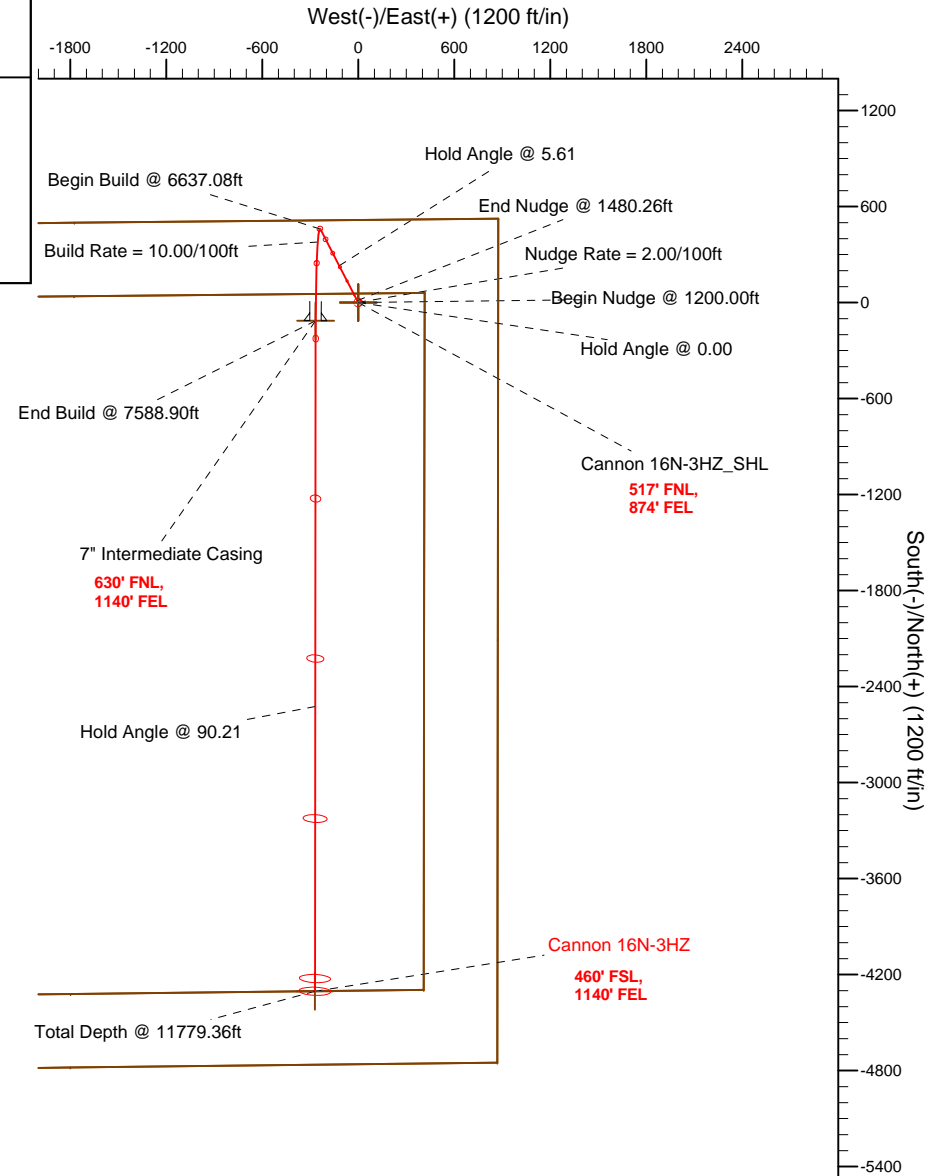
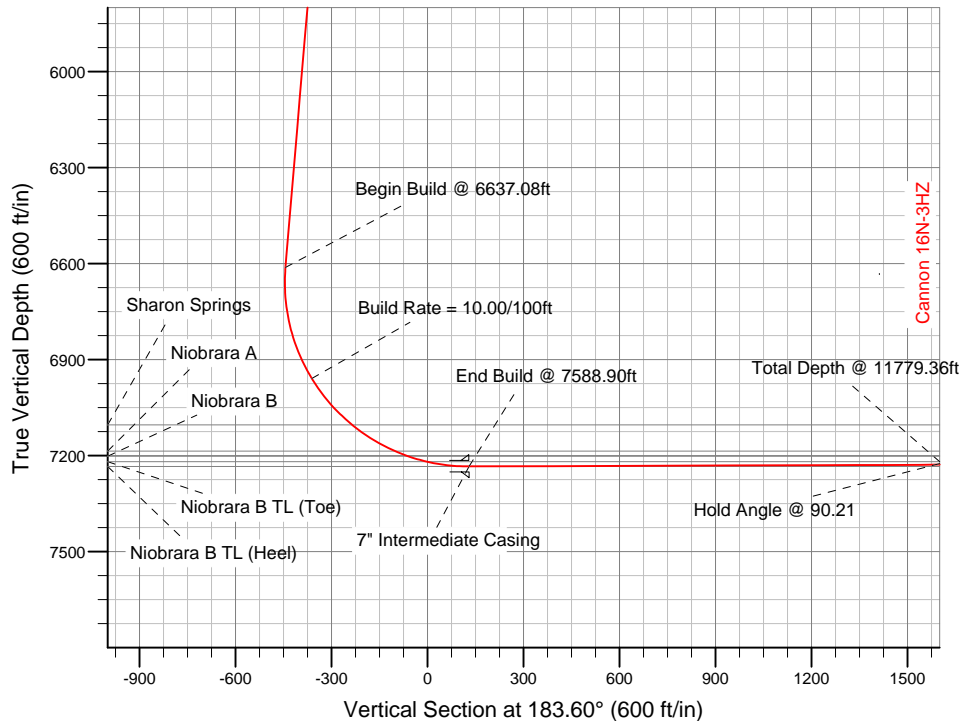
SECTION DETAILS

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	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00	
3	1480.26	5.61	332.71	1479.82	12.17	-6.28	2.00	332.71	-11.76	
4	6637.08	5.61	332.71	6611.98	459.81	-237.19	0.00	0.00	-444.01	
5	7588.90	90.21	180.07	7234.00	-113.00	-266.00	10.00	-152.53	129.48	Cannon 16N-3HZ_Casing Point
6	11779.36	90.21	180.07	7219.00	-4303.44	-270.84	0.00	0.00	4311.95	Cannon 16N-3HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Cannon 16N-3HZ_Section Line	0.00	0.00	0.00	40.173016	-104.756902	Polygon
Cannon 16N-3HZ_Setback Line	0.00	0.00	0.00	40.173016	-104.756902	Polygon
Cannon 16N-3HZ_SHL	0.00	0.00	0.00	40.173016	-104.756902	Point
Cannon 16N-3HZ_BHL	7219.00	-4303.44	-270.84	40.161203	-104.757871	Point
Cannon 16N-3HZ_Casing Point	7234.00	-113.00	-266.00	40.172706	-104.757854	Point

Target Line:
7234.95' TVDkb @ 0' VS Drilling 90.21°



WELL DETAILS: Cannon 16N-3HZ

Ground Level: 5022.00 RKB=17 @ 5039.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Cannon 16N-3HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 10/16/2012
 Reviewed: _____ Date: _____

Plan Report for Cannon 16N-3HZ - 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
Hold Angle @ 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
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 1200.00ft										
1,300.00	2.00	332.71	1,299.98	1.55	-0.80	-1.50	2.00	2.00	0.00	332.71
Nudge Rate = 2.00/100ft										
1,400.00	4.00	332.71	1,399.84	6.20	-3.20	-5.99	2.00	2.00	0.00	0.00
1,480.26	5.61	332.71	1,479.81	12.17	-6.28	-11.76	2.00	2.00	0.00	0.00
End Nudge @ 1480.26ft										
1,500.00	5.61	332.71	1,499.46	13.89	-7.16	-13.41	0.00	0.00	0.00	0.00
1,600.00	5.61	332.71	1,598.98	22.57	-11.64	-21.79	0.00	0.00	0.00	0.00
1,700.00	5.61	332.71	1,698.50	31.25	-16.12	-30.17	0.00	0.00	0.00	0.00
1,800.00	5.61	332.71	1,798.02	39.93	-20.60	-38.56	0.00	0.00	0.00	0.00
1,900.00	5.61	332.71	1,897.55	48.61	-25.07	-46.94	0.00	0.00	0.00	0.00
2,000.00	5.61	332.71	1,997.07	57.29	-29.55	-55.32	0.00	0.00	0.00	0.00
2,100.00	5.61	332.71	2,096.59	65.97	-34.03	-63.70	0.00	0.00	0.00	0.00
2,200.00	5.61	332.71	2,196.11	74.65	-38.51	-72.08	0.00	0.00	0.00	0.00
2,300.00	5.61	332.71	2,295.63	83.33	-42.99	-80.47	0.00	0.00	0.00	0.00
2,400.00	5.61	332.71	2,395.16	92.01	-47.46	-88.85	0.00	0.00	0.00	0.00
2,500.00	5.61	332.71	2,494.68	100.69	-51.94	-97.23	0.00	0.00	0.00	0.00
2,600.00	5.61	332.71	2,594.20	109.37	-56.42	-105.61	0.00	0.00	0.00	0.00
2,700.00	5.61	332.71	2,693.72	118.05	-60.90	-114.00	0.00	0.00	0.00	0.00
2,800.00	5.61	332.71	2,793.24	126.73	-65.37	-122.38	0.00	0.00	0.00	0.00
2,900.00	5.61	332.71	2,892.76	135.41	-69.85	-130.76	0.00	0.00	0.00	0.00
3,000.00	5.61	332.71	2,992.29	144.10	-74.33	-139.14	0.00	0.00	0.00	0.00
3,100.00	5.61	332.71	3,091.81	152.78	-78.81	-147.52	0.00	0.00	0.00	0.00
3,200.00	5.61	332.71	3,191.33	161.46	-83.28	-155.91	0.00	0.00	0.00	0.00
3,300.00	5.61	332.71	3,290.85	170.14	-87.76	-164.29	0.00	0.00	0.00	0.00
3,349.38	5.61	332.71	3,340.00	174.42	-89.97	-168.43	0.00	0.00	0.00	0.00
Parkman										
3,400.00	5.61	332.71	3,390.37	178.82	-92.24	-172.67	0.00	0.00	0.00	0.00
3,500.00	5.61	332.71	3,489.90	187.50	-96.72	-181.05	0.00	0.00	0.00	0.00
3,600.00	5.61	332.71	3,589.42	196.18	-101.20	-189.43	0.00	0.00	0.00	0.00
3,700.00	5.61	332.71	3,688.94	204.86	-105.67	-197.82	0.00	0.00	0.00	0.00
3,800.00	5.61	332.71	3,788.46	213.54	-110.15	-206.20	0.00	0.00	0.00	0.00
3,900.00	5.61	332.71	3,887.98	222.22	-114.63	-214.58	0.00	0.00	0.00	0.00
4,000.00	5.61	332.71	3,987.50	230.90	-119.11	-222.96	0.00	0.00	0.00	0.00
Hold Angle @ 5.61										
4,100.00	5.61	332.71	4,087.03	239.58	-123.58	-231.35	0.00	0.00	0.00	0.00
4,200.00	5.61	332.71	4,186.55	248.26	-128.06	-239.73	0.00	0.00	0.00	0.00
4,300.00	5.61	332.71	4,286.07	256.94	-132.54	-248.11	0.00	0.00	0.00	0.00
4,400.00	5.61	332.71	4,385.59	265.62	-137.02	-256.49	0.00	0.00	0.00	0.00
4,500.00	5.61	332.71	4,485.11	274.30	-141.50	-264.87	0.00	0.00	0.00	0.00
4,507.92	5.61	332.71	4,493.00	274.99	-141.85	-265.54	0.00	0.00	0.00	0.00
Sussex										
4,600.00	5.61	332.71	4,584.64	282.98	-145.97	-273.26	0.00	0.00	0.00	0.00

Plan Report for Cannon 16N-3HZ - 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	5.61	332.71	4,684.16	291.66	-150.45	-281.64	0.00	0.00	0.00	0.00
4,800.00	5.61	332.71	4,783.68	300.35	-154.93	-290.02	0.00	0.00	0.00	0.00
4,900.00	5.61	332.71	4,883.20	309.03	-159.41	-298.40	0.00	0.00	0.00	0.00
5,000.00	5.61	332.71	4,982.72	317.71	-163.88	-306.79	0.00	0.00	0.00	0.00
5,100.00	5.61	332.71	5,082.25	326.39	-168.36	-315.17	0.00	0.00	0.00	0.00
5,200.00	5.61	332.71	5,181.77	335.07	-172.84	-323.55	0.00	0.00	0.00	0.00
5,300.00	5.61	332.71	5,281.29	343.75	-177.32	-331.93	0.00	0.00	0.00	0.00
5,400.00	5.61	332.71	5,380.81	352.43	-181.80	-340.31	0.00	0.00	0.00	0.00
5,500.00	5.61	332.71	5,480.33	361.11	-186.27	-348.70	0.00	0.00	0.00	0.00
5,600.00	5.61	332.71	5,579.85	369.79	-190.75	-357.08	0.00	0.00	0.00	0.00
5,700.00	5.61	332.71	5,679.38	378.47	-195.23	-365.46	0.00	0.00	0.00	0.00
5,800.00	5.61	332.71	5,778.90	387.15	-199.71	-373.84	0.00	0.00	0.00	0.00
5,900.00	5.61	332.71	5,878.42	395.83	-204.18	-382.22	0.00	0.00	0.00	0.00
6,000.00	5.61	332.71	5,977.94	404.51	-208.66	-390.61	0.00	0.00	0.00	0.00
6,100.00	5.61	332.71	6,077.46	413.19	-213.14	-398.99	0.00	0.00	0.00	0.00
6,200.00	5.61	332.71	6,176.99	421.87	-217.62	-407.37	0.00	0.00	0.00	0.00
6,300.00	5.61	332.71	6,276.51	430.55	-222.09	-415.75	0.00	0.00	0.00	0.00
6,400.00	5.61	332.71	6,376.03	439.23	-226.57	-424.14	0.00	0.00	0.00	0.00
6,500.00	5.61	332.71	6,475.55	447.91	-231.05	-432.52	0.00	0.00	0.00	0.00
6,600.00	5.61	332.71	6,575.07	456.59	-235.53	-440.90	0.00	0.00	0.00	0.00
6,637.08	5.61	332.71	6,611.98	459.81	-237.19	-444.01	0.00	0.00	0.00	0.00
Begin Build @ 6637.08ft										
6,700.00	2.90	243.07	6,674.77	461.83	-240.02	-445.84	10.00	-4.30	-142.47	-152.53
6,800.00	11.60	192.77	6,773.93	450.85	-244.51	-434.60	10.00	8.70	-50.31	-63.03
6,900.00	21.46	186.66	6,869.69	422.79	-248.86	-406.33	10.00	9.86	-6.10	-12.95
7,000.00	31.41	184.31	6,959.12	378.52	-252.95	-361.89	10.00	9.95	-2.35	-7.07
Build Rate = 10.00/100ft										
7,100.00	41.38	183.01	7,039.51	319.38	-256.66	-302.63	10.00	9.97	-1.30	-4.96
7,192.97	50.66	182.19	7,104.00	252.62	-259.65	-235.82	10.00	9.98	-0.88	-3.91
Sharon Springs										
7,200.00	51.36	182.14	7,108.42	247.16	-259.86	-230.35	10.00	9.98	-0.75	-3.34
7,300.00	61.35	181.49	7,163.76	164.06	-262.47	-147.25	10.00	9.99	-0.65	-3.31
7,350.52	66.39	181.21	7,186.00	118.73	-263.53	-101.95	10.00	9.99	-0.56	-2.94
Niobrara A										
7,394.34	70.77	180.98	7,202.00	77.95	-264.31	-61.20	10.00	9.99	-0.52	-2.82
Niobrara B										
7,400.00	71.34	180.95	7,203.84	72.60	-264.40	-55.85	10.00	9.99	-0.50	-2.74
7,500.00	81.32	180.47	7,227.44	-24.43	-265.59	41.07	10.00	9.99	-0.48	-2.73
7,588.90	90.20	180.07	7,234.00	-113.00	-266.00	129.48	10.00	9.99	-0.45	-2.61
End Build @ 7588.90ft - Niobrara B TL (Heel) - 7" Intermediate Casing - Cannon 16N-3HZ_Casing Point										
7,600.00	90.21	180.07	7,233.96	-124.10	-266.01	140.57	0.00	0.00	0.00	-2.58
7,700.00	90.21	180.07	7,233.60	-224.10	-266.13	240.37	0.00	0.00	0.00	0.00
7,800.00	90.21	180.07	7,233.24	-324.10	-266.24	340.18	0.00	0.00	0.00	0.00
7,900.00	90.21	180.07	7,232.89	-424.10	-266.36	439.99	0.00	0.00	0.00	0.00
8,000.00	90.21	180.07	7,232.53	-524.10	-266.47	539.80	0.00	0.00	0.00	0.00
8,100.00	90.21	180.07	7,232.17	-624.10	-266.59	639.61	0.00	0.00	0.00	0.00
8,200.00	90.21	180.07	7,231.81	-724.10	-266.71	739.42	0.00	0.00	0.00	0.00
8,300.00	90.21	180.07	7,231.45	-824.10	-266.82	839.23	0.00	0.00	0.00	0.00
8,400.00	90.21	180.07	7,231.10	-924.10	-266.94	939.04	0.00	0.00	0.00	0.00
8,500.00	90.21	180.07	7,230.74	-1,024.10	-267.05	1,038.85	0.00	0.00	0.00	0.00
8,600.00	90.21	180.07	7,230.38	-1,124.09	-267.17	1,138.66	0.00	0.00	0.00	0.00
8,700.00	90.21	180.07	7,230.02	-1,224.09	-267.28	1,238.47	0.00	0.00	0.00	0.00
8,800.00	90.21	180.07	7,229.66	-1,324.09	-267.40	1,338.27	0.00	0.00	0.00	0.00
8,900.00	90.21	180.07	7,229.31	-1,424.09	-267.51	1,438.08	0.00	0.00	0.00	0.00
9,000.00	90.21	180.07	7,228.95	-1,524.09	-267.63	1,537.89	0.00	0.00	0.00	0.00
9,100.00	90.21	180.07	7,228.59	-1,624.09	-267.74	1,637.70	0.00	0.00	0.00	0.00
9,200.00	90.21	180.07	7,228.23	-1,724.09	-267.86	1,737.51	0.00	0.00	0.00	0.00
9,300.00	90.21	180.07	7,227.88	-1,824.09	-267.98	1,837.32	0.00	0.00	0.00	0.00
9,400.00	90.21	180.07	7,227.52	-1,924.09	-268.09	1,937.13	0.00	0.00	0.00	0.00

Plan Report for Cannon 16N-3HZ - 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)	Toothface Azimuth (°)
9,500.00	90.21	180.07	7,227.16	-2,024.09	-268.21	2,036.94	0.00	0.00	0.00	0.00
9,600.00	90.21	180.07	7,226.80	-2,124.09	-268.32	2,136.75	0.00	0.00	0.00	0.00
9,700.00	90.21	180.07	7,226.44	-2,224.09	-268.44	2,236.56	0.00	0.00	0.00	0.00
9,800.00	90.21	180.07	7,226.09	-2,324.09	-268.55	2,336.37	0.00	0.00	0.00	0.00
9,900.00	90.21	180.07	7,225.73	-2,424.09	-268.67	2,436.17	0.00	0.00	0.00	0.00
10,000.00	90.21	180.07	7,225.37	-2,524.08	-268.78	2,535.98	0.00	0.00	0.00	0.00
Hold Angle @ 90.21										
10,100.00	90.21	180.07	7,225.01	-2,624.08	-268.90	2,635.79	0.00	0.00	0.00	0.00
10,200.00	90.21	180.07	7,224.65	-2,724.08	-269.01	2,735.60	0.00	0.00	0.00	0.00
10,300.00	90.21	180.07	7,224.30	-2,824.08	-269.13	2,835.41	0.00	0.00	0.00	0.00
10,400.00	90.21	180.07	7,223.94	-2,924.08	-269.25	2,935.22	0.00	0.00	0.00	0.00
10,500.00	90.21	180.07	7,223.58	-3,024.08	-269.36	3,035.03	0.00	0.00	0.00	0.00
10,600.00	90.21	180.07	7,223.22	-3,124.08	-269.48	3,134.84	0.00	0.00	0.00	0.00
10,700.00	90.21	180.07	7,222.86	-3,224.08	-269.59	3,234.65	0.00	0.00	0.00	0.00
10,800.00	90.21	180.07	7,222.51	-3,324.08	-269.71	3,334.46	0.00	0.00	0.00	0.00
10,900.00	90.21	180.07	7,222.15	-3,424.08	-269.82	3,434.27	0.00	0.00	0.00	0.00
11,000.00	90.21	180.07	7,221.79	-3,524.08	-269.94	3,534.07	0.00	0.00	0.00	0.00
11,100.00	90.21	180.07	7,221.43	-3,624.08	-270.05	3,633.88	0.00	0.00	0.00	0.00
11,200.00	90.21	180.07	7,221.07	-3,724.08	-270.17	3,733.69	0.00	0.00	0.00	0.00
11,300.00	90.21	180.07	7,220.72	-3,824.08	-270.29	3,833.50	0.00	0.00	0.00	0.00
11,400.00	90.21	180.07	7,220.36	-3,924.07	-270.40	3,933.31	0.00	0.00	0.00	0.00
11,500.00	90.21	180.07	7,220.00	-4,024.07	-270.52	4,033.12	0.00	0.00	0.00	0.00
11,600.00	90.21	180.07	7,219.64	-4,124.07	-270.63	4,132.93	0.00	0.00	0.00	0.00
11,700.00	90.21	180.07	7,219.28	-4,224.07	-270.75	4,232.74	0.00	0.00	0.00	0.00
11,779.35	90.21	180.07	7,219.00	-4,303.42	-270.84	4,311.94	0.00	0.00	0.00	0.00
Niobrara B TL (Toe)										
11,779.36	90.21	180.07	7,219.00	-4,303.43	-270.84	4,311.95	0.01	0.00	0.00	0.00
Total Depth @ 11779.36ft - Cannon 16N-3HZ_BHL										

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
600.00	600.00	0.00	0.00	Hold Angle @ 0.00
1,200.00	1,200.00	0.00	0.00	Begin Nudge @ 1200.00ft
1,300.00	1,299.98	1.55	-0.80	Nudge Rate = 2.00/100ft
1,480.26	1,479.81	12.17	-6.28	End Nudge @ 1480.26ft
4,000.00	3,987.50	230.90	-119.11	Hold Angle @ 5.61
6,637.08	6,611.98	459.81	-237.19	Begin Build @ 6637.08ft
7,000.00	6,959.12	378.52	-252.95	Build Rate = 10.00/100ft
7,588.90	7,234.00	-113.00	-266.00	End Build @ 7588.90ft
10,000.00	7,225.37	-2,524.08	-268.78	Hold Angle @ 90.21
11,779.36	7,219.00	-4,303.43	-270.84	Total Depth @ 11779.36ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	+N/-S (ft)	+E/-W (ft)	Start TVD (ft)
Target	Cannon 16N-3HZ_BHL	183.60	Slot	0.00	0.00	7,219.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	7,588.90	Plan A Rev 0 Permit	MWD
7,588.90	11,779.36	Plan A Rev 0 Permit	MWD

Plan Report for Cannon 16N-3HZ - Plan A Rev 0 Permit**Casing Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,588.90	7,234.00	7" Intermediate Casing	7	8-3/4

Formation Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,349.38	3,340.00	Parkman		0.00	
4,507.92	4,493.00	Sussex		0.00	
7,192.97	7,104.00	Sharon Springs		0.00	
7,350.52	7,186.00	Niobrara A		0.00	
7,394.34	7,202.00	Niobrara B		0.00	
7,588.90	7,234.00	Niobrara B TL (Heel)		0.00	
11,779.35	7,219.00	Niobrara B TL (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Cannon 16N-3HZ_Casing Point	7,234.00	-113.00	-266.00	Point
Cannon 16N-3HZ_BHL	7,219.00	-4,303.44	-270.84	Point
Cannon 16N-3HZ_SHL	0.00	0.00	0.00	Point
Cannon 16N-3HZ_Section Line	0.00	0.00	0.00	Polygon
Cannon 16N-3HZ_Setback Line	0.00	0.00	0.00	Polygon

North Reference Sheet for Sec. 3-T2N-R66W - Cannon 16N-3HZ - 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 @ 5039.00ft (Drilling Rig). Northing and Easting are relative to Cannon 16N-3HZ
 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: 0.99995776

Grid Coordinates of Well: 1,306,742.73 ft N, 3,207,650.98 ft E
 Geographical Coordinates of Well: 40° 10' 22.86" N, 104° 45' 24.85" W
 Grid Convergence at Surface is: 0.48°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,779.36ft
 the Bottom Hole Displacement is 4,311.95ft in the Direction of 183.60° (True).
 Magnetic Convergence at surface is: -8.23° (16 October 2012, , BGGM2012)

