

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 24-T3N-R66W

Miller 29N-24HZ

Plan A Rev 0

Plan: Plan A Rev 0 Permit

Sperry Drilling Services

Proposal Report

21 January, 2013

Well Coordinates: 1,318,323.08 N, 3,214,126.68 E (40° 12' 16.75" N, 104° 44' 00.14" W)

Ground Level: 5,016.00 ft

Local Coordinate Origin:

Centered on Well Miller 29N-24HZ

Viewing Datum:

RKB=16 @ 5032.00ft (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. 24-T3N-R66W
 Well: Miller 29N-24HZ
 Wellbore: Plan A Rev 0
 Design: Plan A Rev 0 Permit

Anadarko Petroleum Corp.

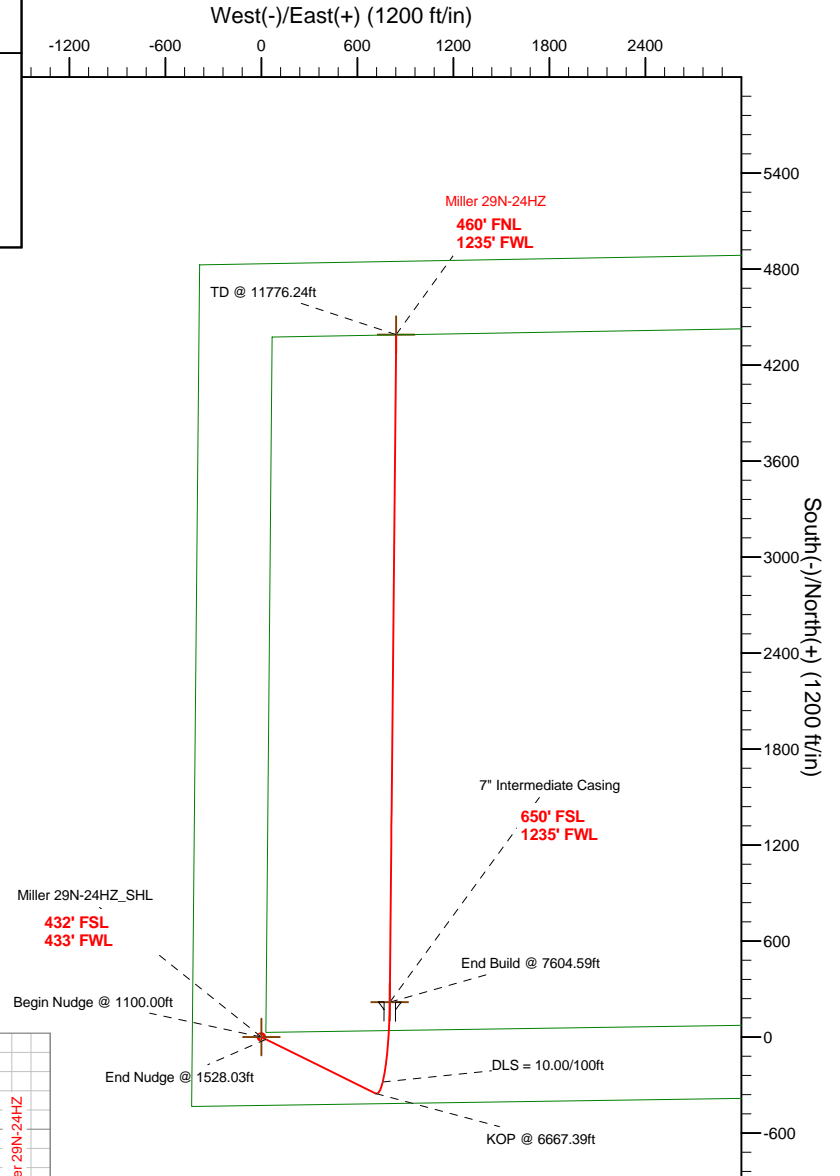
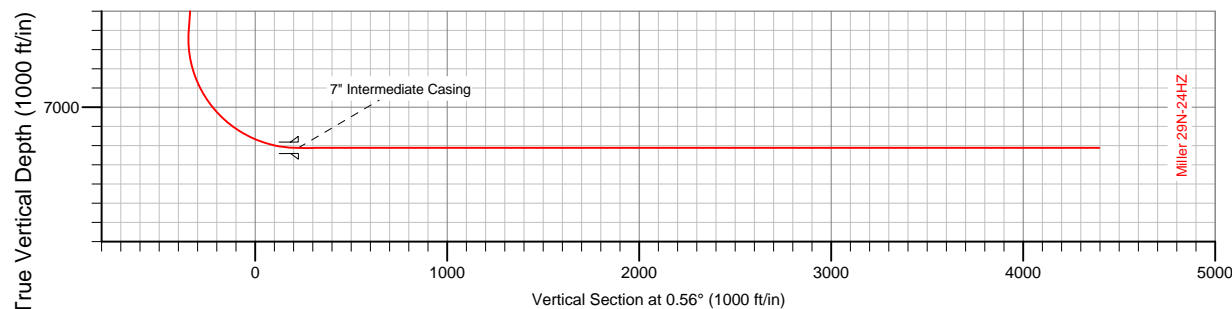
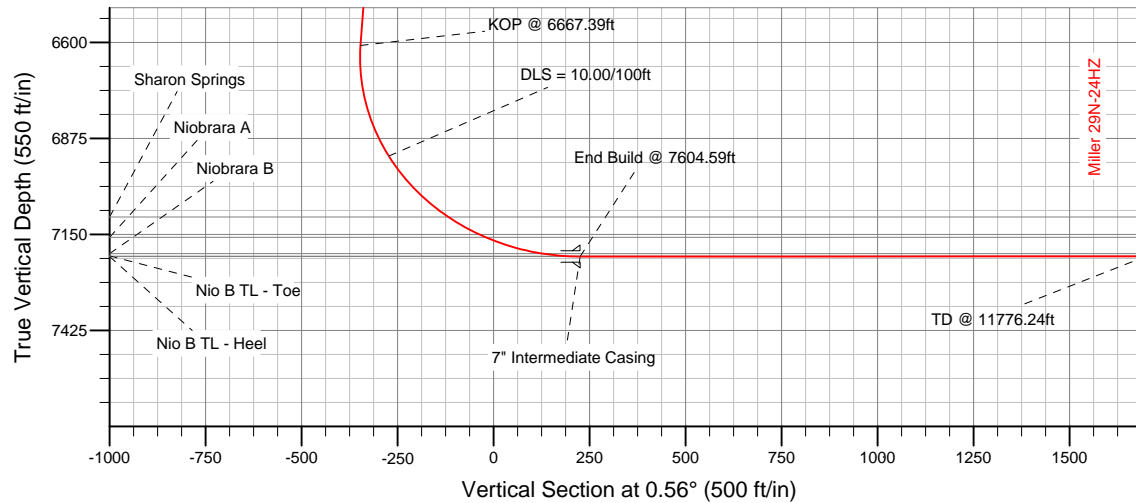
HALLIBURTON
 Sperry Drilling

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	1528.03	8.56	116.30	1526.44	-14.14	28.61	2.00	116.30	-13.86	
4	6667.39	8.56	116.30	6608.54	-353.07	714.46	0.00	0.00	-346.07	
5	7604.59	90.01	0.56	7213.00	218.00	802.00	10.00	-115.49	225.83	Miller 29N-24HZ_CP
6	11776.24	90.01	0.56	7212.00	4389.46	842.57	0.00	0.00	4397.48	Miller 29N-24HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Miller 29N-24HZ_SHL	0.00	0.00	0.00	40.204653	-104.733371	Point
Miller 29N-24HZ_BHL	7212.00	4389.46	842.57	40.216702	-104.730354	Point
Miller 29N-24HZ_CP	7213.00	218.00	802.00	40.205251	-104.730500	Point



WELL DETAILS: Miller 29N-24HZ

Ground Level: 5016.00
 RKB=16 @ 5032.00ft (Drilling Rig)

Plan: Plan A Rev 0 Permit (Miller 29N-24HZ/Plan A Rev 0)

Created By: Fred Hartmann Date: 01/21/2013
 Reviewed: Date:

Plan Report for Miller 29N-24HZ - 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
Begin Nudge @ 1100.00ft										
1,200.00	2.00	116.30	1,199.98	-0.77	1.56	-0.76	2.00	2.00	0.00	116.30
1,300.00	4.00	116.30	1,299.84	-3.09	6.26	-3.03	2.00	2.00	0.00	0.00
1,400.00	6.00	116.30	1,399.45	-6.95	14.07	-6.81	2.00	2.00	0.00	0.00
1,500.00	8.00	116.30	1,498.70	-12.35	24.99	-12.11	2.00	2.00	0.00	0.00
1,528.03	8.56	116.30	1,526.44	-14.14	28.61	-13.86	2.00	2.00	0.00	0.00
End Nudge @ 1528.03ft										
1,600.00	8.56	116.30	1,597.61	-18.89	38.22	-18.51	0.00	0.00	0.00	0.00
1,700.00	8.56	116.30	1,696.49	-25.48	51.56	-24.98	0.00	0.00	0.00	0.00
1,800.00	8.56	116.30	1,795.38	-32.08	64.91	-31.44	0.00	0.00	0.00	0.00
1,900.00	8.56	116.30	1,894.27	-38.67	78.25	-37.90	0.00	0.00	0.00	0.00
2,000.00	8.56	116.30	1,993.15	-45.27	91.60	-44.37	0.00	0.00	0.00	0.00
2,100.00	8.56	116.30	2,092.04	-51.86	104.94	-50.83	0.00	0.00	0.00	0.00
2,200.00	8.56	116.30	2,190.92	-58.46	118.29	-57.30	0.00	0.00	0.00	0.00
2,300.00	8.56	116.30	2,289.81	-65.05	131.63	-63.76	0.00	0.00	0.00	0.00
2,400.00	8.56	116.30	2,388.69	-71.64	144.98	-70.22	0.00	0.00	0.00	0.00
2,500.00	8.56	116.30	2,487.58	-78.24	158.32	-76.69	0.00	0.00	0.00	0.00
2,600.00	8.56	116.30	2,586.47	-84.83	171.67	-83.15	0.00	0.00	0.00	0.00
2,700.00	8.56	116.30	2,685.35	-91.43	185.01	-89.62	0.00	0.00	0.00	0.00
2,800.00	8.56	116.30	2,784.24	-98.02	198.36	-96.08	0.00	0.00	0.00	0.00
2,900.00	8.56	116.30	2,883.12	-104.62	211.70	-102.54	0.00	0.00	0.00	0.00
3,000.00	8.56	116.30	2,982.01	-111.21	225.05	-109.01	0.00	0.00	0.00	0.00
3,100.00	8.56	116.30	3,080.90	-117.81	238.39	-115.47	0.00	0.00	0.00	0.00
3,200.00	8.56	116.30	3,179.78	-124.40	251.74	-121.94	0.00	0.00	0.00	0.00
3,300.00	8.56	116.30	3,278.67	-131.00	265.08	-128.40	0.00	0.00	0.00	0.00
3,400.00	8.56	116.30	3,377.55	-137.59	278.43	-134.87	0.00	0.00	0.00	0.00
3,500.00	8.56	116.30	3,476.44	-144.19	291.77	-141.33	0.00	0.00	0.00	0.00
3,600.00	8.56	116.30	3,575.33	-150.78	305.12	-147.79	0.00	0.00	0.00	0.00
3,700.00	8.56	116.30	3,674.21	-157.38	318.46	-154.26	0.00	0.00	0.00	0.00
3,800.00	8.56	116.30	3,773.10	-163.97	331.81	-160.72	0.00	0.00	0.00	0.00
3,900.00	8.56	116.30	3,871.98	-170.57	345.15	-167.19	0.00	0.00	0.00	0.00
4,000.00	8.56	116.30	3,970.87	-177.16	358.50	-173.65	0.00	0.00	0.00	0.00
4,100.00	8.56	116.30	4,069.75	-183.76	371.84	-180.11	0.00	0.00	0.00	0.00
4,200.00	8.56	116.30	4,168.64	-190.35	385.19	-186.58	0.00	0.00	0.00	0.00
4,300.00	8.56	116.30	4,267.53	-196.95	398.53	-193.04	0.00	0.00	0.00	0.00
4,400.00	8.56	116.30	4,366.41	-203.54	411.88	-199.51	0.00	0.00	0.00	0.00
4,500.00	8.56	116.30	4,465.30	-210.14	425.22	-205.97	0.00	0.00	0.00	0.00
4,518.91	8.56	116.30	4,484.00	-211.38	427.75	-207.19	0.00	0.00	0.00	0.00
Sussex										
4,600.00	8.56	116.30	4,564.18	-216.73	438.57	-212.43	0.00	0.00	0.00	0.00
4,700.00	8.56	116.30	4,663.07	-223.33	451.91	-218.90	0.00	0.00	0.00	0.00
4,800.00	8.56	116.30	4,761.96	-229.92	465.26	-225.36	0.00	0.00	0.00	0.00
4,900.00	8.56	116.30	4,860.84	-236.52	478.60	-231.83	0.00	0.00	0.00	0.00
5,000.00	8.56	116.30	4,959.73	-243.11	491.95	-238.29	0.00	0.00	0.00	0.00
5,100.00	8.56	116.30	5,058.61	-249.70	505.29	-244.75	0.00	0.00	0.00	0.00
5,200.00	8.56	116.30	5,157.50	-256.30	518.64	-251.22	0.00	0.00	0.00	0.00

Plan Report for Miller 29N-24HZ - 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	8.56	116.30	5,256.39	-262.89	531.98	-257.68	0.00	0.00	0.00	0.00
5,400.00	8.56	116.30	5,355.27	-269.49	545.33	-264.15	0.00	0.00	0.00	0.00
5,500.00	8.56	116.30	5,454.16	-276.08	558.67	-270.61	0.00	0.00	0.00	0.00
5,600.00	8.56	116.30	5,553.04	-282.68	572.02	-277.07	0.00	0.00	0.00	0.00
5,700.00	8.56	116.30	5,651.93	-289.27	585.36	-283.54	0.00	0.00	0.00	0.00
5,800.00	8.56	116.30	5,750.81	-295.87	598.71	-290.00	0.00	0.00	0.00	0.00
5,900.00	8.56	116.30	5,849.70	-302.46	612.05	-296.47	0.00	0.00	0.00	0.00
6,000.00	8.56	116.30	5,948.59	-309.06	625.40	-302.93	0.00	0.00	0.00	0.00
6,100.00	8.56	116.30	6,047.47	-315.65	638.74	-309.40	0.00	0.00	0.00	0.00
6,200.00	8.56	116.30	6,146.36	-322.25	652.09	-315.86	0.00	0.00	0.00	0.00
6,300.00	8.56	116.30	6,245.24	-328.84	665.43	-322.32	0.00	0.00	0.00	0.00
6,400.00	8.56	116.30	6,344.13	-335.44	678.78	-328.79	0.00	0.00	0.00	0.00
6,500.00	8.56	116.30	6,443.02	-342.03	692.12	-335.25	0.00	0.00	0.00	0.00
6,600.00	8.56	116.30	6,541.90	-348.63	705.47	-341.72	0.00	0.00	0.00	0.00
6,667.39	8.56	116.30	6,608.54	-353.07	714.46	-346.07	0.00	0.00	0.00	0.00
KOP @ 6667.39ft										
6,700.00	7.73	93.87	6,640.83	-354.29	718.83	-347.25	10.00	-2.53	-68.79	-115.49
6,800.00	12.26	39.16	6,739.48	-346.49	732.28	-339.32	10.00	4.53	-54.71	-93.28
6,900.00	20.97	21.28	6,835.28	-321.52	745.51	-314.22	10.00	8.71	-17.88	-39.24
7,000.00	30.46	13.89	6,925.29	-280.14	758.12	-272.72	10.00	9.49	-7.39	-22.05
DLS = 10.00/100ft										
7,100.00	40.18	9.80	7,006.80	-223.60	769.73	-216.07	10.00	9.72	-4.09	-15.37
7,200.00	50.00	7.09	7,077.32	-153.63	779.97	-146.00	10.00	9.82	-2.71	-12.02
7,236.68	53.61	6.29	7,100.00	-125.00	783.33	-117.34	10.00	9.85	-2.18	-10.10
Sharon Springs										
7,300.00	59.86	5.07	7,134.72	-72.34	788.55	-64.63	10.00	9.87	-1.93	-9.61
7,350.17	64.80	4.22	7,158.00	-28.07	792.14	-20.32	9.97	9.85	-1.71	-8.94
Niobrara A										
7,400.00	69.75	3.43	7,177.24	17.78	795.20	25.55	10.03	9.93	-1.59	-8.54
7,500.00	79.65	1.98	7,203.59	114.01	799.71	121.82	10.00	9.90	-1.45	-8.23
7,508.15	80.46	1.87	7,205.00	122.03	799.98	129.85	10.00	9.91	-1.39	-7.85
Niobrara B										
7,600.00	89.56	0.62	7,212.98	213.41	801.95	221.24	10.00	9.91	-1.36	-7.83
7,604.59	90.01	0.56	7,213.00	218.00	802.00	225.83	9.99	9.90	-1.34	-7.72
End Build @ 7604.59ft - Nio B TL - Heel - 7" Intermediate Casing - Miller 29N-24HZ_CP										
7,700.00	90.01	0.56	7,212.98	313.41	802.93	321.24	0.00	0.00	0.00	-7.72
7,800.00	90.01	0.56	7,212.95	413.40	803.90	421.24	0.00	0.00	0.00	0.00
7,900.00	90.01	0.56	7,212.93	513.40	804.87	521.24	0.00	0.00	0.00	0.00
8,000.00	90.01	0.56	7,212.91	613.39	805.85	621.24	0.00	0.00	0.00	0.00
8,100.00	90.01	0.56	7,212.88	713.39	806.82	721.24	0.00	0.00	0.00	0.00
8,200.00	90.01	0.56	7,212.86	813.38	807.79	821.24	0.00	0.00	0.00	0.00
8,300.00	90.01	0.56	7,212.83	913.38	808.76	921.24	0.00	0.00	0.00	0.00
8,400.00	90.01	0.56	7,212.81	1,013.38	809.74	1,021.24	0.00	0.00	0.00	0.00
8,500.00	90.01	0.56	7,212.79	1,113.37	810.71	1,121.24	0.00	0.00	0.00	0.00
8,600.00	90.01	0.56	7,212.76	1,213.37	811.68	1,221.24	0.00	0.00	0.00	0.00
8,700.00	90.01	0.56	7,212.74	1,313.36	812.65	1,321.24	0.00	0.00	0.00	0.00
8,800.00	90.01	0.56	7,212.71	1,413.36	813.63	1,421.24	0.00	0.00	0.00	0.00
8,900.00	90.01	0.56	7,212.69	1,513.35	814.60	1,521.24	0.00	0.00	0.00	0.00
9,000.00	90.01	0.56	7,212.67	1,613.35	815.57	1,621.24	0.00	0.00	0.00	0.00
9,100.00	90.01	0.56	7,212.64	1,713.34	816.54	1,721.24	0.00	0.00	0.00	0.00
9,200.00	90.01	0.56	7,212.62	1,813.34	817.52	1,821.24	0.00	0.00	0.00	0.00
9,300.00	90.01	0.56	7,212.59	1,913.33	818.49	1,921.24	0.00	0.00	0.00	0.00
9,400.00	90.01	0.56	7,212.57	2,013.33	819.46	2,021.24	0.00	0.00	0.00	0.00
9,500.00	90.01	0.56	7,212.55	2,113.32	820.43	2,121.24	0.00	0.00	0.00	0.00
9,600.00	90.01	0.56	7,212.52	2,213.32	821.41	2,221.24	0.00	0.00	0.00	0.00
9,700.00	90.01	0.56	7,212.50	2,313.31	822.38	2,321.24	0.00	0.00	0.00	0.00
9,800.00	90.01	0.56	7,212.47	2,413.31	823.35	2,421.24	0.00	0.00	0.00	0.00
9,900.00	90.01	0.56	7,212.45	2,513.30	824.33	2,521.24	0.00	0.00	0.00	0.00
10,000.00	90.01	0.56	7,212.43	2,613.30	825.30	2,621.24	0.00	0.00	0.00	0.00

Plan Report for Miller 29N-24HZ - 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 (°)
10,100.00	90.01	0.56	7,212.40	2,713.29	826.27	2,721.24	0.00	0.00	0.00	0.00
10,200.00	90.01	0.56	7,212.38	2,813.29	827.24	2,821.24	0.00	0.00	0.00	0.00
10,300.00	90.01	0.56	7,212.35	2,913.29	828.22	2,921.24	0.00	0.00	0.00	0.00
10,400.00	90.01	0.56	7,212.33	3,013.28	829.19	3,021.24	0.00	0.00	0.00	0.00
10,500.00	90.01	0.56	7,212.31	3,113.28	830.16	3,121.24	0.00	0.00	0.00	0.00
10,600.00	90.01	0.56	7,212.28	3,213.27	831.13	3,221.24	0.00	0.00	0.00	0.00
10,700.00	90.01	0.56	7,212.26	3,313.27	832.11	3,321.24	0.00	0.00	0.00	0.00
10,800.00	90.01	0.56	7,212.23	3,413.26	833.08	3,421.24	0.00	0.00	0.00	0.00
10,900.00	90.01	0.56	7,212.21	3,513.26	834.05	3,521.24	0.00	0.00	0.00	0.00
11,000.00	90.01	0.56	7,212.19	3,613.25	835.02	3,621.24	0.00	0.00	0.00	0.00
11,100.00	90.01	0.56	7,212.16	3,713.25	836.00	3,721.24	0.00	0.00	0.00	0.00
11,200.00	90.01	0.56	7,212.14	3,813.24	836.97	3,821.24	0.00	0.00	0.00	0.00
11,300.00	90.01	0.56	7,212.11	3,913.24	837.94	3,921.24	0.00	0.00	0.00	0.00
11,400.00	90.01	0.56	7,212.09	4,013.23	838.91	4,021.24	0.00	0.00	0.00	0.00
11,500.00	90.01	0.56	7,212.07	4,113.23	839.89	4,121.24	0.00	0.00	0.00	0.00
11,600.00	90.01	0.56	7,212.04	4,213.22	840.86	4,221.24	0.00	0.00	0.00	0.00
11,700.00	90.01	0.56	7,212.02	4,313.22	841.83	4,321.24	0.00	0.00	0.00	0.00
11,776.23	90.01	0.56	7,212.00	4,389.45	842.57	4,397.47	0.00	0.00	0.00	0.00
Nio B TL - Toe										
11,776.24	90.01	0.56	7,212.00	4,389.46	842.57	4,397.48	0.01	0.00	0.00	0.00
TD @ 11776.24ft - Miller 29N-24HZ_BHL										

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
1,528.03	1,526.44	-14.14	28.61	End Nudge @ 1528.03ft
6,667.39	6,608.54	-353.07	714.46	KOP @ 6667.39ft
7,000.00	6,925.29	-280.14	758.12	DLS = 10.00/100ft
7,604.59	7,213.00	218.00	802.00	End Build @ 7604.59ft
11,776.24	7,212.00	4,389.46	842.57	TD @ 11776.24ft

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	+E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	0.56	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
0.00	11,776.24	Plan A Rev 0 Permit	MWD

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")
7,604.59	7,213.00	7" Intermediate Casing	7	8-3/4

Plan Report for Miller 29N-24HZ - Plan A Rev 0 Permit**Formation Details**

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
4,518.91	4,484.00	Sussex		0.00	
7,236.68	7,100.00	Sharon Springs		0.00	
7,350.17	7,158.00	Niobrara A		0.00	
7,508.15	7,205.00	Niobrara B		0.00	
7,604.59	7,213.00	Nio B TL - Heel		0.00	
11,776.23	7,212.00	Nio B TL - Toe		0.00	

Targets associated with this wellbore

Target Name	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Shape
Miller 29N-24HZ_BHL	7,212.00	4,389.46	842.57	Point
Miller 29N-24HZ_SHL	0.00	0.00	0.00	Point
Miller 29N-24HZ_CP	7,213.00	218.00	802.00	Point

North Reference Sheet for Sec. 24-T3N-R66W - Miller 29N-24HZ - 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=16 @ 5032.00ft (Drilling Rig). Northing and Easting are relative to Miller 29N-24HZ
 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: 0.99995717

Grid Coordinates of Well: 1,318,323.08 ft N, 3,214,126.68 ft E
 Geographical Coordinates of Well: 40° 12' 16.75" N, 104° 44' 00.14" W
 Grid Convergence at Surface is: 0.50°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,776.24ft
 the Bottom Hole Displacement is 4,469.59ft in the Direction of 10.87° (True).

Magnetic Convergence at surface is: -8.17° (21 January 2013, , BGGM2012)

