

Project: Weld County, CO (NAD 83)
 Site: Sec. 31-T1N-R67W
 Well: Sack 30C-30HZ
 Wellbore: Plan A
 Design: Rev A0 Permit

Anadarko Petroleum Corp.

HALLIBURTON
 Sperry Drilling

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	3520.00	0.00	0.00	3520.00	0.00	0.00	0.00	0.00	0.00	
3	4020.00	10.00	270.00	4017.47	0.00	-43.52	2.00	270.00	0.00	
4	6760.00	10.00	270.00	6715.84	0.00	-519.32	0.00	0.00	0.00	
5	7260.00	0.00	0.00	7213.30	0.00	-562.84	2.00	180.00	0.00	
6	7360.76	0.00	0.00	7314.06	0.00	-562.84	0.00	0.00	0.00	
7	8265.74	90.50	0.00	7887.00	577.94	-562.79	10.00	0.00	577.94	
8	17464.89	90.50	0.00	7807.00	9776.74	-562.04	0.00	0.00	9776.74	Sack 30C-30HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

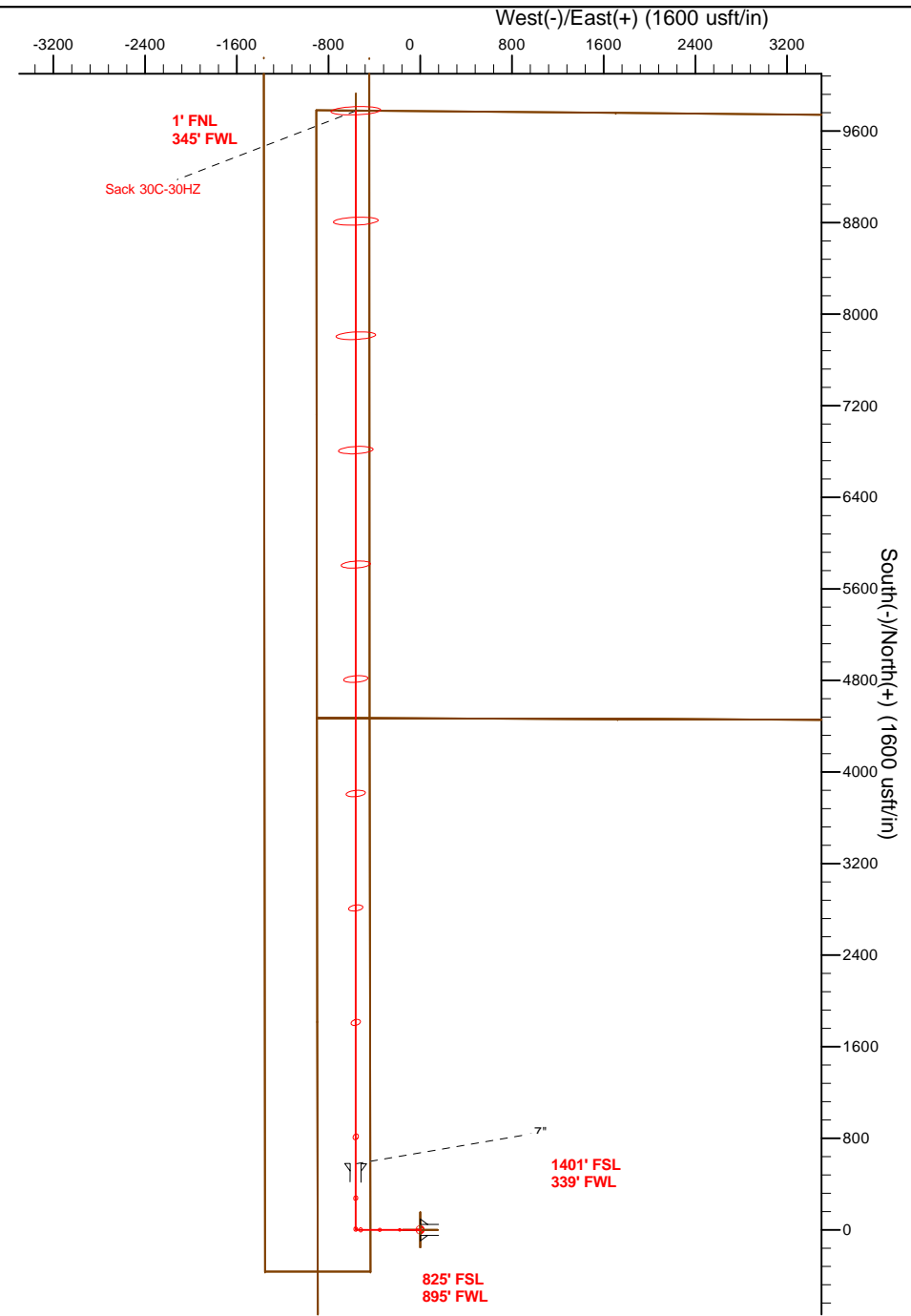
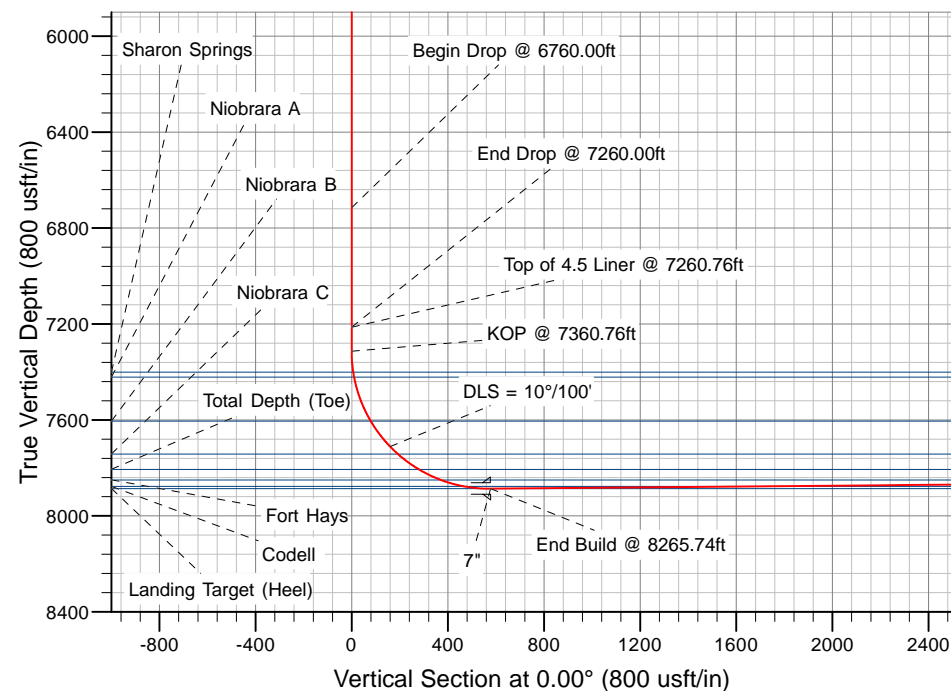
Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
Sack 30C-30HZ_LD	0.00	0.00	0.00	40.002606	-104.939347	
Sack 30C-30HZ_SEC	0.00	0.00	0.00	40.002606	-104.939347	Polygon
Sack 30C-30HZ_SHL	0.00	0.00	0.00	40.002606	-104.939347	
Sack 30C-30HZ_BHL	7807.00	9776.74	-562.04	40.029444	-104.941354	

WELL DETAILS: Sack 30C-30HZ

Ground Level: 5065.00
 RKB = 17' @ 5082.00usft (Drilling Rig)

Plan: Rev A0 Permit (Sack 30C-30HZ/Plan A)

TVD MD
 7214.06 7260.76 Top of 4.5 Liner @ 7260.76ft
 7314.06 7360.76 KOP @ 7360.76ft



Plan: Rev A0 Permit

Proposal Report

23 December, 2013

Local Coordinate Origin:

Centered on Well Sa

HALLIBURTON



Plan Report for Sack 30C-30HZ - Rev A0 Permit

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sack 30C-30HZ_SHL - Sack 30C-30HZ_SEC - Sack 30C-30HZ_LD										
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
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,237.00	0.00	0.00	1,237.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Marker										
1,287.00	0.00	0.00	1,287.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9 5/8"										
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600							

Plan Report for Sack 30C-30HZ - Rev A0 Permit

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
4,900.00	10.00	270.00	4,884.10	0.00	-196.33	0.00	0.00	0.00	0.00	0.00
5,000.00	10.00	270.00	4,982.58	0.00	-213.70	0.00	0.00	0.00	0.00	0.00
5,100.00	10.00	270.00	5,081.06	0.00	-231.06	0.00	0.00	0.00	0.00	0.00
5,100.96	10.00	270.00	5,082.00	0.00	-231.23	0.00	0.00	0.00	0.00	0.00
Sussex										
5,200.00	10.00	270.00	5,179.54	0.00	-248.43	0.00	0.00	0.00	0.00	0.00
5,300.00	10.00	270.00	5,278.02	0.00	-265.79	0.00	0.00	0.00	0.00	0.00
5,400.00	10.00	270.00	5,376.50	0.00	-283.16	0.00	0.00	0.00	0.00	0.00
5,426.91	10.00	270.00	5,403.00	0.00	-287.83	0.00	0.00	0.00	0.00	0.00
Shannon										
5,500.00	10.00	270.00	5,474.98	0.00	-300.52	0.00	0.00	0.00	0.00	0.00
5,600.00	10.00	270.00	5,573.46	0.00	-317.89	0.00	0.00	0.00	0.00	0.00
5,700.00	10.00	270.00	5,671.94	0.00	-335.25	0.00	0.00	0.00	0.00	0.00
5,800.00	10.00	270.00	5,770.42	0.00	-352.62	0.00	0.00	0.00	0.00	0.00
5,900.00	10.00	270.00	5,868.90	0.00	-369.98	0.00	0.00	0.00	0.00	0.00
6,000.00	10.00	270.00	5,967.38	0.00	-387.35	0.00	0.00	0.00	0.00	0.00
6,100.00	10.00	270.00	6,065.87	0.00	-404.71	0.00	0.00	0.00	0.00	0.00
6,200.00	10.00	270.00	6,164.35	0.00	-422.08	0.00	0.00	0.00	0.00	0.00
6,300.00	10.00	270.00	6,262.83	0.00	-439.44	0.00	0.00	0.00	0.00	0.00
6,400.00	10.00	270.00	6,361.31	0.00	-456.81	0.00	0.00	0.00	0.00	0.00
6,500.00	10.00	270.00	6,459.79	0.00	-474.17	0.00	0.00	0.00	0.00	0.00
6,600.00	10.00	270.00	6,558.27	0.00	-491.53	0.00	0.00	0.00	0.00	0.00
6,700.00	10.00	270.00	6,656.75	0.00	-508.90	0.00	0.00	0.00	0.00	0.00
6,760.00	10.00	270.00	6,715.84	0.00	-519.32	0.00	0.00	0.00	0.00	0.00
Begin Drop @ 6760.00ft										
6,800.00	9.20	270.00	6,755.28	0.00	-525.99	0.00	2.00	-2.00	0.00	180.00
6,900.00	7.20	270.00	6,854.25	0.00	-540.25	0.00	2.00	-2.00	0.00	180.00
7,000.00	5.20	270.00	6,953.66	0.00	-551.05	0.00	2.00	-2.00	0.00	180.00
7,100.00	3.20	270.00	7,053.39	0.00	-558.37	0.00	2.00	-2.00	0.00	180.00
7,200.00	1.20	270.00	7,153.31	0.00	-562.21	0.00	2.00	-2.00	0.00	180.00
7,260.00	0.00	0.00	7,213.30	0.00	-562.84	0.00	2.00	-2.00	0.00	180.00
End Drop @ 7260.00ft										
7,260.76	0.00	0.00	7,214.06	0.00	-562.84	0.00	0.00	0.00	0.00	0.00
Top of 4.5 Liner @ 7260.76ft										
7,300.00	0.00	0.00	7,253.30	0.00	-562.84	0.00	0.00	0.00	0.00	0.00
7,360.76	0.00	0.00	7,314.06	0.00	-562.84	0.00	0.00	0.00	0.00	0.00
KOP @ 7360.76ft										
7,400.00	3.92	0.00	7,353.27	1.34	-562.84	1.34	10.00	10.00	0.00	0.00
7,448.03	8.73	0.00	7,401.00	6.63	-562.84	6.63	10.00	10.00	0.00	0.00
Sharon Springs										
7,469.34	10.86	0.00	7,422.00	10.26	-562.84	10.26	10.00	10.00	0.00	0.00
Niobrara A										
7,500.00	13.92	0.00	7,451.94	16.84	-562.84	16.84	10.00	10.00	0.00	0.00
7,600.00	23.92	0.00	7,546.41	49.23	-562.84	49.23	10.00	10.00	0.00	0.00
7,665.92	30.52	0.00	7,605.00	79.36	-562.83	79.36	10.00	10.00	0.00	0.00
Niobrara B										
7,700.00	33.92	0.00	7,633.83	97.53	-562.83	97.53	10.00	10.00	0.00	0.00
7,800.00	43.92	0.00	7,711.53	160.28	-562.83	160.28	10.00	10.00	0.00	0.00
DLS = 10°/100'										
7,845.48	48.47	0.00	7,743.00	193.10	-562.83	193.10	10.00	10.00	0.00	0.00
Niobrara C										
7,900.00	53.92	0.00	7,777.15	235.57	-562.82	235.57	10.00	10.00	0.00	0.00
8,000.00	63.92	0.00	7,828.70	321.11	-562.82	321.11	10.00	10.00	0.00	0.00
8,056.51	69.58	0.00	7,851.00	373.01	-562.81	373.01	10.00	10.00	0.00	0.00
Fort Hays										
8,100.00	73.92	0.00	7,864.62	414.30	-562.81	414.30	10.00	10.00	0.00	0.00
8,153.44	79.27	0.00	7,877.00	466.26	-562.80	466.26	10.00	10.00	0.00	0.00
Codell										



Plan Report for Sack 30C-30HZ - Rev A0 Permit

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
8,200.00	83.92	0.00	7,883.80	512.31	-562.80	512.31	10.00	10.00	0.00	0.00
8,265.74	90.50	0.00	7,887.00	577.94	-562.79	577.94	10.00	10.00	0.00	0.00
End Build @ 8265.74ft - Landing Target (Heel) - 7"										
8,300.00	90.50	0.00	7,886.70	612.20	-562.79	612.20	0.00	0.00	0.00	0.00
8,400.00	90.50	0.00	7,885.83	712.19	-562.78	712.19	0.00	0.00	0.00	0.00
8,500.00	90.50	0.00	7,884.96	812.19	-562.77	812.19	0.00	0.00	0.00	0.00
8,600.00	90.50	0.00	7,884.09	912.19	-562.77	912.19	0.00	0.00	0.00	0.00
8,700.00	90.50	0.00	7,883.22	1,012.18	-562.76	1,012.18	0.00	0.00	0.00	0.00
8,800.00	90.50	0.00	7,882.35	1,112.18	-562.75	1,112.18	0.00	0.00	0.00	0.00
8,900.00	90.50	0.00	7,881.48	1,212.17	-562.74	1,212.17	0.00	0.00	0.00	0.00
9,000.00	90.50	0.00	7,880.61	1,312.17	-562.73	1,312.17	0.00	0.00	0.00	0.00
9,100.00	90.50	0.00	7,879.75	1,412.17	-562.73	1,412.17	0.00	0.00	0.00	0.00
9,200.00	90.50	0.00	7,878.88	1,512.16	-562.72	1,512.16	0.00	0.00	0.00	0.00
9,300.00	90.50	0.00	7,878.01	1,612.16	-562.7	1,612.16	0.00			

Plan Report for Sack 30C-30HZ - Rev A0 Permit

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
13,900.00	90.50	0.00	7,838.00	6,211.98	-562.33	6,211.98	0.00	0.00	0.00	0.00
14,000.00	90.50	0.00	7,837.13	6,311.98	-562.33	6,311.98	0.00	0.00	0.00	0.00
14,100.00	90.50	0.00	7,836.26	6,411.98	-562.32	6,411.98	0.00	0.00	0.00	0.00
14,200.00	90.50	0.00	7,835.39	6,511.97	-562.31	6,511.97	0.00	0.00	0.00	0.00
14,300.00										



Plan Report for Sack 30C-30HZ - Rev A0 Permit

Vertical Section Information

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

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
0.00	8,265.74	Rev A0 Permit	MWD
8,265.74	17,464.89	Rev A0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,287.00	1,287.00	9 5/8"	9-5/8	13-1/2
8,265.74	7,887.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,237.00	1,237.00	Fox Hills Marker		0.00	
5,100.96	5,082.00	Sussex		0.00	
5,426.91	5,403.00	Shannon		0.00	
7,448.03	7,401.00	Sharon Springs		0.00	
7,469.34	7,422.00	Niobrara A		0.00	
7,665.92	7,605.00	Niobrara B		0.00	
7,845.48	7,743.00	Niobrara C		0.00	
8,056.51	7,851.00	Fort Hays		0.00	
8,153.44	7,877.00	Codell		0.00	
8,265.74	7,887.00	Landing Target (Heel)		0.00	
17,464.89	7,807.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Sack 30C-30HZ_SHL	0.00	0.00	0.00	Point
Sack 30C-30HZ_SEC	0.00	0.00	0.00	Polygon
Sack 30C-30HZ_LD	0.00	0.00	0.00	Polygon
Sack 30C-30HZ_BHL	7,807.00	9,776.74	-562.04	Point

North Reference Sheet for Sec. 31-T1N-R67W - Sack 30C-30HZ - Plan A

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' @ 5082.00usft (Drilling Rig). Northing and Easting are relative to Sack 30C-30HZ
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: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996617

Grid Coordinates of Well: 1,244,292.64 usft N, 3,157,061.90 usft E
Geographical Coordinates of Well: 40° 00' 09.38" N, 104° 56' 21.65" W
Grid Convergence at Surface is: 0.36°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,464.89usft
the Bottom Hole Displacement is 9,792.88usft in the Direction of 356.71° (True).
Magnetic Convergence at surface is: -8.26° (23 December 2013, , BGGM2013)

