

Project: Weld County, CO (NAD 83)
Site: Sec. 31-T1N-R67W
Well: Sack 28C-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	3650.00	0.00	0.00	3650.00	0.00	0.00	0.00	0.00	0.00	
3	4150.00	10.00	90.00	4147.47	0.00	43.52	2.00	90.00	0.00	
4	6745.00	10.00	90.00	6703.04	0.00	494.14	0.00	0.00	0.00	
5	7245.00	0.00	0.00	7200.51	0.00	537.66	2.00	180.00	0.00	
6	7348.55	0.00	0.00	7304.06	0.00	537.66	0.00	0.00	0.00	
7	8252.42	90.39	0.00	7877.00	576.83	537.70	10.00	0.00	576.83	
8	17433.97	90.39	0.00	7815.00	9758.16	538.24	0.00	0.00	9758.16	Sack 28C-30HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	
Sack 28C-30HZ_LD	0.00	0.00	0.00	40.002606	-104.935759	
Sack 28C-30HZ_SEC	0.00	0.00	0.00	40.002606	-104.935759	Polygon
Sack 28C-30HZ_SHL	0.00	0.00	0.00	40.002606	-104.935759	
Sack 28C-30HZ_BHL	7815.00	9758.16	538.24	40.029393	-104.933837	

WELL DETAILS: Sack 28C-30HZ

Ground Level: 5055.00

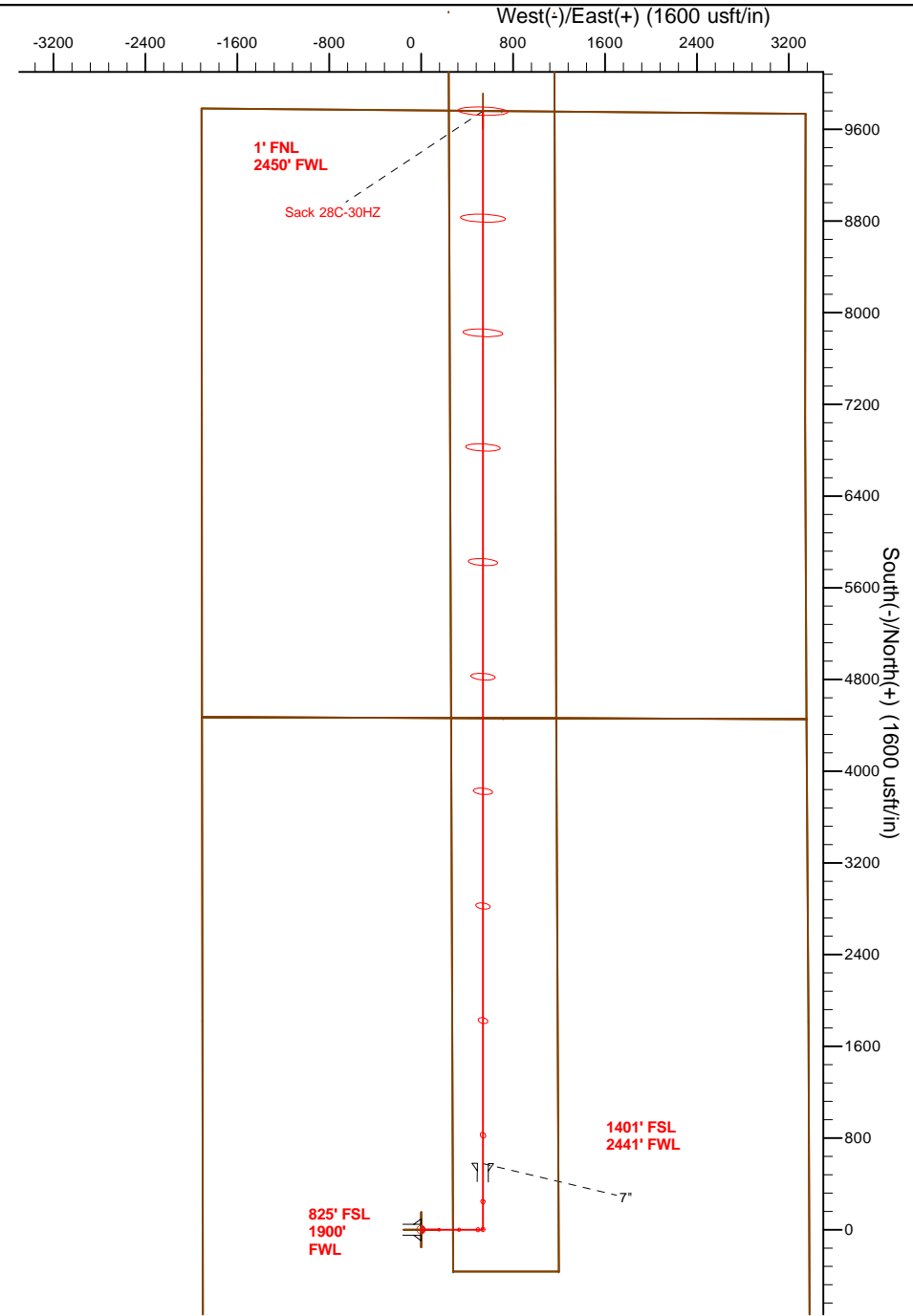
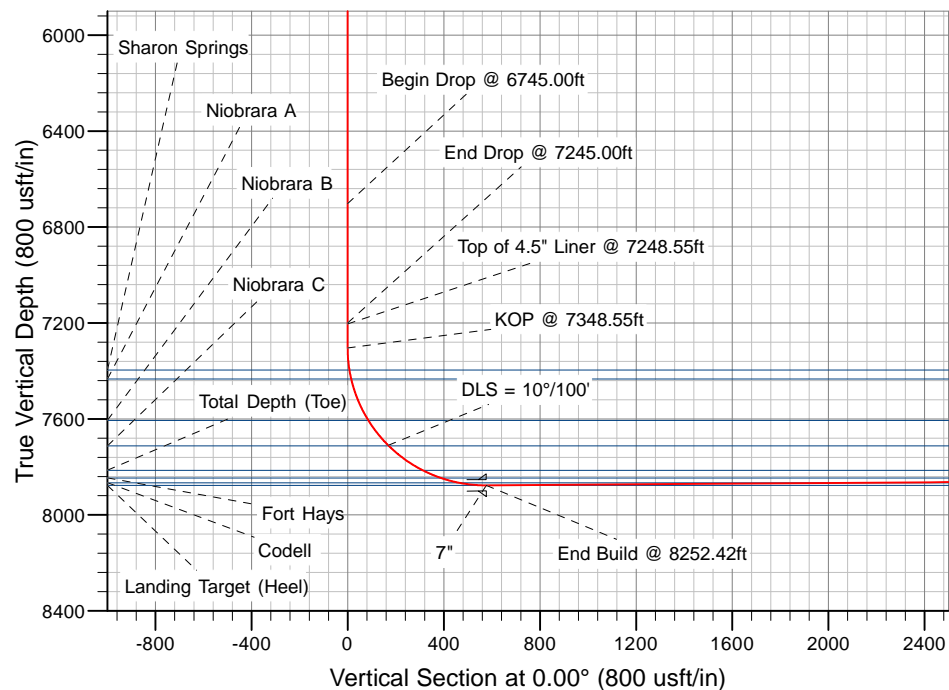
RKB = 17' @ 5072.00usft (Drilling Rig)

Plan: Rev A0 Permit (Sack 28C-30HZ/Plan A)

Created By: Clint Eshelman Date: 12/23/2013
Reviewed: Date:

TVD MD

7204.06 7248.55 Top of 4.5" Liner @ 7248.55ft
7304.06 7348.55 KOP @ 7348.55ft



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 31-T1N-R67W

Sack 28C-30HZ

Plan A

Plan: Rev A0 Permit

Sperry Drilling Services

Proposal Report

23 December, 2013

Well Coordinates: 1,244,299.01 N, 3,158,067.04 E (40° 00' 09.38" N, 104° 56' 08.73" W)

Ground Level: 5,055.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Sack 28C-30HZ

RKB = 17' @ 5072.00usft (Drilling Rig)

N

True

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Plan Report for Sack 28C-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 28C-30HZ_SHL - Sack 28C-30HZ_LD - Sack 28C-30HZ_SEC										
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
1,227.00	0.00	0.00	1,227.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fox Hills Marker										
1,277.00	0.00	0.00	1,277.00	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	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3,650.00	0.00	0.00	3,650.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge @ 3650.00ft										
3,700.00	1.00	90.00	3,700.00	0.00	0.44	0.00	2.00	2.00	0.00	90.00
3,800.00	3.00	90.00	3,799.93	0.00	3.93	0.00	2.00	2.00	0.00	0.00
3,900.00	5.00	90.00	3,899.68	0.00	10.90	0.00	2.00	2.00	0.00	0.00
4,000.00	7.00	90.00	3,999.13	0.00	21.35	0.00	2.00	2.00	0.00	0.00
4,100.00	9.00	90.00	4,098.15	0.00	35.27	0.00	2.00	2.00	0.00	0.00
4,150.00	10.00	90.00	4,147.47	0.00	43.52	0.00	2.00	2.00	0.00	0.00
End Nudge @ 4150.00ft										
4,200.00	10.00	90.00	4,196.71	0.00	52.20	0.00	0.00	0.00	0.00	0.00
4,300.00	10.00	90.00	4,295.19	0.00	69.57	0.00	0.00	0.00	0.00	0.00
4,400.00	10.00	90.00	4,393.67	0.00	86.93	0.00	0.00	0.00	0.00	0.00
4,500.00	10.00	90.00	4,492.15	0.00	104.30	0.00	0.00	0.00	0.00	0.00
4,600.00	10.00	90.00	4,590.63	0.00	121.66	0.00	0.00	0.00	0.00	0.00
4,700.00	10.00	90.00	4,689.11	0.00	139.03	0.00	0.00	0.00	0.00	0.00
4,800.00	10.00	90.00	4,787.59	0.00	156.39	0.00	0.00	0.00	0.00	0.00

Plan Report for Sack 28C-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	90.00	4,886.07	0.00	173.76	0.00	0.00	0.00	0.00	0.00
5,000.00	10.00	90.00	4,984.55	0.00	191.12	0.00	0.00	0.00	0.00	0.00
5,088.80	10.00	90.00	5,072.00	0.00	206.54	0.00	0.00	0.00	0.00	0.00
Sussex										
5,100.00	10.00	90.00	5,083.03	0.00	208.49	0.00	0.00	0.00	0.00	0.00
5,200.00	10.00	90.00	5,181.51	0.00	225.85	0.00	0.00	0.00	0.00	0.00
5,300.00	10.00	90.00	5,279.99	0.00	243.22	0.00	0.00	0.00	0.00	0.00
5,400.00	10.00	90.00	5,378.48	0.00	260.58	0.00	0.00	0.00	0.00	0.00
5,414.75	10.00	90.00	5,393.00	0.00	263.14	0.00	0.00	0.00	0.00	0.00
Shannon										
5,500.00	10.00	90.00	5,476.96	0.00	277.95	0.00	0.00	0.00	0.00	0.00
5,600.00	10.00	90.00	5,575.44	0.00	295.31	0.00	0.00	0.00	0.00	0.00
5,700.00	10.00	90.00	5,673.92	0.00	312.68	0.00	0.00	0.00	0.00	0.00
5,800.00	10.00	90.00	5,772.40	0.00	330.04	0.00	0.00	0.00	0.00	0.00
5,900.00	10.00	90.00	5,870.88	0.00	347.41	0.00	0.00	0.00	0.00	0.00
6,000.00	10.00	90.00	5,969.36	0.00	364.77	0.00	0.00	0.00	0.00	0.00
6,100.00	10.00	90.00	6,067.84	0.00	382.14	0.00	0.00	0.00	0.00	0.00
6,200.00	10.00	90.00	6,166.32	0.00	399.50	0.00	0.00	0.00	0.00	0.00
6,300.00	10.00	90.00	6,264.80	0.00	416.87	0.00	0.00	0.00	0.00	0.00
6,400.00	10.00	90.00	6,363.28	0.00	434.23	0.00	0.00	0.00	0.00	0.00
6,500.00	10.00	90.00	6,461.76	0.00	451.60	0.00	0.00	0.00	0.00	0.00
6,600.00	10.00	90.00	6,560.24	0.00	468.96	0.00	0.00	0.00	0.00	0.00
6,700.00	10.00	90.00	6,658.73	0.00	486.33	0.00	0.00	0.00	0.00	0.00
6,745.00	10.00	90.00	6,703.04	0.00	494.14	0.00	0.00	0.00	0.00	0.00
Begin Drop @ 6745.00ft										
6,800.00	8.90	90.00	6,757.29	0.00	503.17	0.00	2.00	-2.00	0.00	180.00
6,900.00	6.90	90.00	6,856.34	0.00	516.91	0.00	2.00	-2.00	0.00	180.00
7,000.00	4.90	90.00	6,955.81	0.00	527.19	0.00	2.00	-2.00	0.00	180.00
7,100.00	2.90	90.00	7,055.57	0.00	533.99	0.00	2.00	-2.00	0.00	180.00
7,200.00	0.90	90.00	7,155.51	0.00	537.31	0.00	2.00	-2.00	0.00	180.00
7,245.00	0.00	0.00	7,200.51	0.00	537.66	0.00	2.00	-2.00	0.00	-180.00
End Drop @ 7245.00ft										
7,248.55	0.00	0.00	7,204.06	0.00	537.66	0.00	0.00	0.00	0.00	0.00
Top of 4.5" Liner @ 7248.55ft										
7,300.00	0.00	0.00	7,255.51	0.00	537.66	0.00	0.00	0.00	0.00	0.00
7,348.55	0.00	0.00	7,304.06	0.00	537.66	0.00	0.00	0.00	0.00	0.00
KOP @ 7348.55ft										
7,400.00	5.15	0.00	7,355.44	2.31	537.66	2.31	10.00	10.00	0.00	0.00
7,440.89	9.23	0.00	7,396.00	7.43	537.66	7.43	10.00	10.00	0.00	0.00
Sharon Springs										
7,479.63	13.11	0.00	7,434.00	14.93	537.66	14.93	10.00	10.00	0.00	0.00
Niobrara A										
7,500.00	15.15	0.00	7,453.75	19.90	537.66	19.90	10.00	10.00	0.00	0.00
7,600.00	25.15	0.00	7,547.51	54.30	537.67	54.30	10.00	10.00	0.00	0.00
7,667.75	31.92	0.00	7,607.00	86.64	537.67	86.64	10.00	10.00	0.00	0.00
Niobrara B										
7,700.00	35.15	0.00	7,633.88	104.45	537.67	104.45	10.00	10.00	0.00	0.00
7,800.00	45.15	0.00	7,710.22	168.84	537.67	168.84	10.00	10.00	0.00	0.00
DLS = 10°/100'										
7,802.52	45.40	0.00	7,712.00	170.64	537.67	170.64	10.00	10.00	0.00	0.00
Niobrara C										
7,900.00	55.15	0.00	7,774.23	245.51	537.68	245.51	10.00	10.00	0.00	0.00
8,000.00	65.15	0.00	7,823.94	332.13	537.68	332.13	10.00	10.00	0.00	0.00
8,062.27	71.37	0.00	7,847.00	389.95	537.69	389.95	10.00	10.00	0.00	0.00
Fort Hays										
8,100.00	75.15	0.00	7,857.87	426.07	537.69	426.07	10.00	10.00	0.00	0.00
8,141.27	79.27	0.00	7,867.00	466.30	537.69	466.30	10.00	10.00	0.00	0.00
Codell										

Plan Report for Sack 28C-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	85.15	0.00	7,874.96	524.47	537.69	524.47	10.00	10.00	0.00	0.00
8,252.42	90.39	0.00	7,877.00	576.83	537.70	576.83	10.00	10.00	0.00	0.00
End Build @ 8252.42ft - Landing Target (Heel) - 7"										
8,300.00	90.39	0.00	7,876.68	624.41	537.70	624.41	0.00	0.00	0.00	0.00
8,400.00	90.39	0.00	7,876.01	724.40	537.71	724.40	0.00	0.00	0.00	0.00
8,500.00	90.39	0.00	7,875.33	824.40	537.71	824.40	0.00	0.00	0.00	0.00
8,600.00	90.39	0.00	7,874.65	924.40	537.72	924.40	0.00	0.00	0.00	0.00
8,700.00	90.39	0.00	7,873.98	1,024.40	537.72	1,024.40	0.00	0.00	0.00	0.00
8,800.00	90.39	0.00	7,873.30	1,124.40	537.73	1,124.40	0.00	0.00	0.00	0.00
8,900.00	90.39	0.00	7,872.63	1,224.39	537.73	1,224.39	0.00	0.00	0.00	0.00
9,000.00	90.39	0.00	7,871.95	1,324.39	537.74	1,324.39	0.00	0.00	0.00	0.00
9,100.00	90.39	0.00	7,871.28	1,424.39	537.75	1,424.39	0.00	0.00	0.00	0.00
9,200.00	90.39	0.00	7,870.60	1,524.39	537.75	1,524.39	0.00	0.00	0.00	0.00
9,300.00	90.39	0.00	7,869.93	1,624.38	537.76	1,624.38	0.00	0.00	0.00	0.00
9,400.00	90.39	0.00	7,869.25	1,724.38	537.76	1,724.38	0.00	0.00	0.00	0.00
9,500.00	90.39	0.00	7,868.58	1,824.38	537.77	1,824.38	0.00	0.00	0.00	0.00
9,600.00	90.39	0.00	7,867.90	1,924.38	537.78	1,924.38	0.00	0.00	0.00	0.00
9,700.00	90.39	0.00	7,867.23	2,024.37	537.78	2,024.37	0.00	0.00	0.00	0.00
9,800.00	90.39	0.00	7,866.55	2,124.37	537.79	2,124.37	0.00	0.00	0.00	0.00
9,900.00	90.39	0.00	7,865.88	2,224.37	537.79	2,224.37	0.00	0.00	0.00	0.00
10,000.00	90.39	0.00	7,865.20	2,324.37	537.80	2,324.37	0.00	0.00	0.00	0.00
10,100.00	90.39	0.00	7,864.53	2,424.37	537.81	2,424.37	0.00	0.00	0.00	0.00
10,200.00	90.39	0.00	7,863.85	2,524.36	537.81	2,524.36	0.00	0.00	0.00	0.00
10,300.00	90.39	0.00	7,863.17	2,624.36	537.82	2,624.36	0.00	0.00	0.00	0.00
10,400.00	90.39	0.00	7,862.50	2,724.36	537.82	2,724.36	0.00	0.00	0.00	0.00
10,500.00	90.39	0.00	7,861.82	2,824.36	537.83	2,824.36	0.00	0.00	0.00	0.00
10,600.00	90.39	0.00	7,861.15	2,924.35	537.84	2,924.35	0.00	0.00	0.00	0.00
10,700.00	90.39	0.00	7,860.47	3,024.35	537.84	3,024.35	0.00	0.00	0.00	0.00
10,800.00	90.39	0.00	7,859.80	3,124.35	537.85	3,124.35	0.00	0.00	0.00	0.00
10,900.00	90.39	0.00	7,859.12	3,224.35	537.85	3,224.35	0.00	0.00	0.00	0.00
11,000.00	90.39	0.00	7,858.45	3,324.35	537.86	3,324.35	0.00	0.00	0.00	0.00
11,100.00	90.39	0.00	7,857.77	3,424.34	537.87	3,424.34	0.00	0.00	0.00	0.00
11,200.00	90.39	0.00	7,857.10	3,524.34	537.87	3,524.34	0.00	0.00	0.00	0.00
11,300.00	90.39	0.00	7,856.42	3,624.34	537.88	3,624.34	0.00	0.00	0.00	0.00
11,400.00	90.39	0.00	7,855.75	3,724.34	537.88	3,724.34	0.00	0.00	0.00	0.00
11,500.00	90.39	0.00	7,855.07	3,824.33	537.89	3,824.33	0.00	0.00	0.00	0.00
11,600.00	90.39	0.00	7,854.40	3,924.33	537.90	3,924.33	0.00	0.00	0.00	0.00
11,700.00	90.39	0.00	7,853.72	4,024.33	537.90	4,024.33	0.00	0.00	0.00	0.00
11,800.00	90.39	0.00	7,853.05	4,124.33	537.91	4,124.33	0.00	0.00	0.00	0.00
11,900.00	90.39	0.00	7,852.37	4,224.32	537.91	4,224.32	0.00	0.00	0.00	0.00
12,000.00	90.39	0.00	7,851.69	4,324.32	537.92	4,324.32	0.00	0.00	0.00	0.00
12,100.00	90.39	0.00	7,851.02	4,424.32	537.92	4,424.32	0.00	0.00	0.00	0.00
12,200.00	90.39	0.00	7,850.34	4,524.32	537.93	4,524.32	0.00	0.00	0.00	0.00
12,300.00	90.39	0.00	7,849.67	4,624.32	537.94	4,624.32	0.00	0.00	0.00	0.00
12,400.00	90.39	0.00	7,848.99	4,724.31	537.94	4,724.31	0.00	0.00	0.00	0.00
12,500.00	90.39	0.00	7,848.32	4,824.31	537.95	4,824.31	0.00	0.00	0.00	0.00
12,600.00	90.39	0.00	7,847.64	4,924.31	537.95	4,924.31	0.00	0.00	0.00	0.00
12,700.00	90.39	0.00	7,846.97	5,024.31	537.96	5,024.31	0.00	0.00	0.00	0.00
12,800.00	90.39	0.00	7,846.29	5,124.30	537.97	5,124.30	0.00	0.00	0.00	0.00
12,900.00	90.39	0.00	7,845.62	5,224.30	537.97	5,224.30	0.00	0.00	0.00	0.00
13,000.00	90.39	0.00	7,844.94	5,324.30	537.98	5,324.30	0.00	0.00	0.00	0.00
13,100.00	90.39	0.00	7,844.27	5,424.30	537.98	5,424.30	0.00	0.00	0.00	0.00
13,200.00	90.39	0.00	7,843.59	5,524.29	537.99	5,524.29	0.00	0.00	0.00	0.00
13,300.00	90.39	0.00	7,842.92	5,624.29	538.00	5,624.29	0.00	0.00	0.00	0.00
13,400.00	90.39	0.00	7,842.24	5,724.29	538.00	5,724.29	0.00	0.00	0.00	0.00
13,500.00	90.39	0.00	7,841.57	5,824.29	538.01	5,824.29	0.00	0.00	0.00	0.00
13,600.00	90.39	0.00	7,840.89	5,924.29	538.01	5,924.29	0.00	0.00	0.00	0.00
13,700.00	90.39	0.00	7,840.21	6,024.28	538.02	6,024.28	0.00	0.00	0.00	0.00
13,800.00	90.39	0.00	7,839.54	6,124.28	538.03	6,124.28	0.00	0.00	0.00	0.00

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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	90.39	0.00	7,838.86	6,224.28	538.03	6,224.28	0.00	0.00	0.00	0.00
14,000.00	90.39	0.00	7,838.19	6,324.28	538.04	6,324.28	0.00	0.00	0.00	0.00
14,100.00	90.39	0.00	7,837.51	6,424.27	538.04	6,424.27	0.00	0.00	0.00	0.00
14,200.00	90.39	0.00	7,836.84	6,524.27	538.05	6,524.27	0.00	0.00	0.00	0.00
14,300.00	90.39	0.00	7,836.16	6,624.27	538.06	6,624.27	0.00	0.00	0.00	0.00
14,400.00	90.39	0.00	7,835.49	6,724.27	538.06	6,724.27	0.00	0.00	0.00	0.00
14,500.00	90.39	0.00	7,834.81	6,824.27	538.07	6,824.27	0.00	0.00	0.00	0.00
14,600.00	90.39	0.00	7,834.14	6,924.26	538.07	6,924.26	0.00	0.00	0.00	0.00
14,700.00	90.39	0.00	7,833.46	7,024.26	538.08	7,024.26	0.00	0.00	0.00	0.00
14,800.00	90.39	0.00	7,832.79	7,124.26	538.09	7,124.26	0.00	0.00	0.00	0.00
14,900.00	90.39	0.00	7,832.11	7,224.26	538.09	7,224.26	0.00	0.00	0.00	0.00
15,000.00	90.39	0.00	7,831.44	7,324.25	538.10	7,324.25	0.00	0.00	0.00	0.00
15,100.00	90.39	0.00	7,830.76	7,424.25	538.10	7,424.25	0.00	0.00	0.00	0.00
15,200.00	90.39	0.00	7,830.09	7,524.25	538.11	7,524.25	0.00	0.00	0.00	0.00
15,300.00	90.39	0.00	7,829.41	7,624.25	538.11	7,624.25	0.00	0.00	0.00	0.00
15,400.00	90.39	0.00	7,828.74	7,724.24	538.12	7,724.24	0.00	0.00	0.00	0.00
15,500.00	90.39	0.00	7,828.06	7,824.24	538.13	7,824.24	0.00	0.00	0.00	0.00
15,600.00	90.39	0.00	7,827.38	7,924.24	538.13	7,924.24	0.00	0.00	0.00	0.00
15,700.00	90.39	0.00	7,826.71	8,024.24	538.14	8,024.24	0.00	0.00	0.00	0.00
15,800.00	90.39	0.00	7,826.03	8,124.24	538.14	8,124.24	0.00	0.00	0.00	0.00
15,900.00	90.39	0.00	7,825.36	8,224.23	538.15	8,224.23	0.00	0.00	0.00	0.00
16,000.00	90.39	0.00	7,824.68	8,324.23	538.16	8,324.23	0.00	0.00	0.00	0.00
16,100.00	90.39	0.00	7,824.01	8,424.23	538.16	8,424.23	0.00	0.00	0.00	0.00
16,200.00	90.39	0.00	7,823.33	8,524.23	538.17	8,524.23	0.00	0.00	0.00	0.00
16,300.00	90.39	0.00	7,822.66	8,624.22	538.17	8,624.22	0.00	0.00	0.00	0.00
16,400.00	90.39	0.00	7,821.98	8,724.22	538.18	8,724.22	0.00	0.00	0.00	0.00
16,500.00	90.39	0.00	7,821.31	8,824.22	538.19	8,824.22	0.00	0.00	0.00	0.00
16,600.00	90.39	0.00	7,820.63	8,924.22	538.19	8,924.22	0.00	0.00	0.00	0.00
16,700.00	90.39	0.00	7,819.96	9,024.22	538.20	9,024.22	0.00	0.00	0.00	0.00
16,800.00	90.39	0.00	7,819.28	9,124.21	538.20	9,124.21	0.00	0.00	0.00	0.00
16,900.00	90.39	0.00	7,818.61	9,224.21	538.21	9,224.21	0.00	0.00	0.00	0.00
17,000.00	90.39	0.00	7,817.93	9,324.21	538.22	9,324.21	0.00	0.00	0.00	0.00
17,100.00	90.39	0.00	7,817.26	9,424.21	538.22	9,424.21	0.00	0.00	0.00	0.00
17,200.00	90.39	0.00	7,816.58	9,524.20	538.23	9,524.20	0.00	0.00	0.00	0.00
17,300.00	90.39	0.00	7,815.90	9,624.20	538.23	9,624.20	0.00	0.00	0.00	0.00
17,400.00	90.39	0.00	7,815.23	9,724.20	538.24	9,724.20	0.00	0.00	0.00	0.00
17,433.96	90.39	0.00	7,815.00	9,758.16	538.24	9,758.16	0.00	0.00	0.00	0.00
Total Depth (Toe)										
17,433.97	90.39	0.00	7,815.00	9,758.16	538.24	9,758.16	0.00	0.00	0.00	0.00
TD Well @ 17433.97ft - Sack 28C-30HZ_BHL										

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,650.00	3,650.00	0.00	0.00	Begin Nudge @ 3650.00ft
4,150.00	4,147.47	0.00	43.52	End Nudge @ 4150.00ft
6,745.00	6,703.04	0.00	494.14	Begin Drop @ 6745.00ft
7,245.00	7,200.51	0.00	537.66	End Drop @ 7245.00ft
7,248.55	7,204.06	0.00	537.66	Top of 4.5" Liner @ 7248.55ft
7,348.55	7,304.06	0.00	537.66	KOP @ 7348.55ft
7,800.00	7,710.22	168.84	537.67	DLS = 10°/100'
8,252.42	7,877.00	576.83	537.70	End Build @ 8252.42ft
17,433.97	7,815.00	9,758.16	538.24	TD Well @ 17433.97ft

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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	8,252.42	Rev A0 Permit	MWD
8,252.42	17,433.97	Rev A0 Permit	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,277.00	1,277.00	9 5/8"	9-5/8	13-1/2
8,252.42	7,877.00	7"	7	8-3/4

Formation Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,227.00	1,227.00	Fox Hills Marker		0.00	
5,088.80	5,072.00	Sussex		0.00	
5,414.75	5,393.00	Shannon		0.00	
7,440.89	7,396.00	Sharon Springs		0.00	
7,479.63	7,434.00	Niobrara A		0.00	
7,667.75	7,607.00	Niobrara B		0.00	
7,802.52	7,712.00	Niobrara C		0.00	
8,062.27	7,847.00	Fort Hays		0.00	
8,141.27	7,867.00	Codell		0.00	
8,252.42	7,877.00	Landing Target (Heel)		0.00	
17,433.96	7,815.00	Total Depth (Toe)		0.00	

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Sack 28C-30HZ_SHL	0.00	0.00	0.00	Point
Sack 28C-30HZ_LD	0.00	0.00	0.00	Polygon
Sack 28C-30HZ_SEC	0.00	0.00	0.00	Polygon
Sack 28C-30HZ_BHL	7,815.00	9,758.16	538.24	Point

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Directional Difficulty Index

Average Dogleg over Survey:	0.00 °/100usft	Maximum Dogleg over Survey:	0.00 °/100usft at -10.00 usft
Net Tortosity applicable to Plans:	0.00 °/100usft	Directional Difficulty Index:	6.632

Audit Info

North Reference Sheet for Sec. 31-T1N-R67W - Sack 28C-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' @ 5072.00usft (Drilling Rig). Northing and Easting are relative to Sack 28C-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: 1,244,299.01 usft N, 3,158,067.04 usft E
 Geographical Coordinates of Well: 40° 00' 09.38" N, 104° 56' 08.73" W
 Grid Convergence at Surface is: 0.36°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,433.97usft
 the Bottom Hole Displacement is 9,773.00usft in the Direction of 3.16° (True).
 Magnetic Convergence at surface is: -8.26° (23 December 2013, , BGGM2013)

