

SPERRY-SUN DRILLING SERVICES

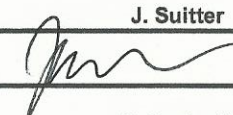

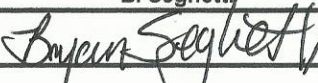
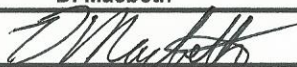
CERTIFIED SURVEY WORK SHEET

OPERATOR:	Anadarko
WELL:	Sack 2C-30HZ
FIELD:	Wattenburg
RIG:	Xtreme 22
LEGALS:	Sec 31-T1N-R67W
COUNTY:	Weld
STATE:	CO
CAL. METHOD:	Min Curvature
MAG. DECL. APPLIED:	8.45
VERTICAL SEC. DIR. :	0.740

SSDS Job Number :	901558422
Start Date of Job :	10/1/2014
End Date of Job :	11/10/2014
Lead Directional Driller:	J. Switter
	B. Seghetti
Other SSDS DD's :	
SSDS MWD Engineers :	C. Wass
	C. Jones
	D. Macbeth

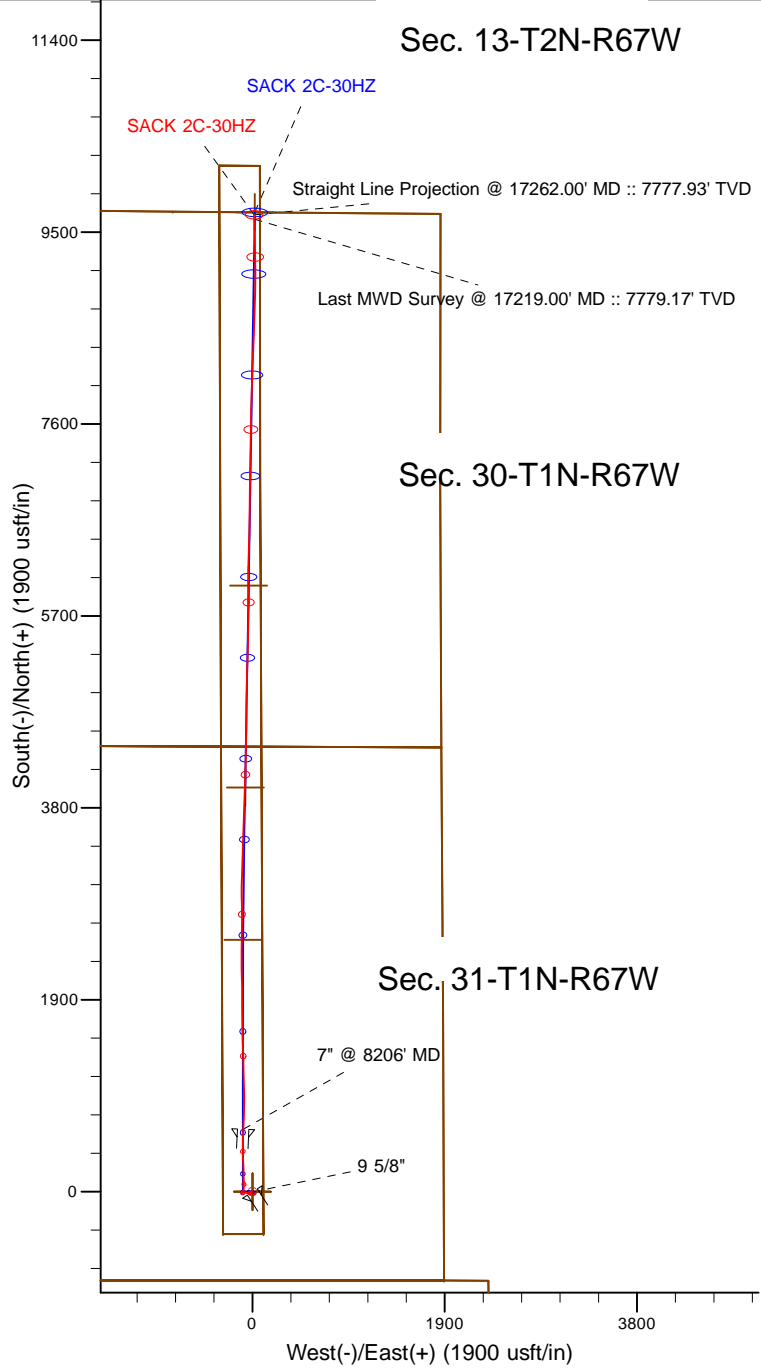
	Main Hole =====>	1st Side Track =====>	2nd Side Track =====>	3rd Side Track =====>	4th Side Track =====>
First Survey Depth	1288.00	Tie On	Tie On	Tie On	Tie On
Last Survey Depth	1412.00				
	17135.00				
KOP Depth/Sidetrack MD	7240.00	KOP	KOP-ST1	KOP-ST2	KOP-ST3
First Survey Depth	1412.00	MWD	MWD	MWD	MWD
Last Survey Depth	17219.00	MWD	MWD	MWD	MWD
Bit Extrapolation to TD	17262.00	T.D.	T.D.	T.D.	T.D.

The following Sperry Sun Drilling Services personnel listed below, do certify the above survey information to be accurate :

Print Name :	J. Switter	Print Name :	C. Wass	Print Name :	
Sign Name :		Sign Name :		Sign Name :	
Print Name :	B. Seghetti	Print Name :	D. Macbeth	Print Name :	
Sign Name :		Sign Name :		Sign Name :	

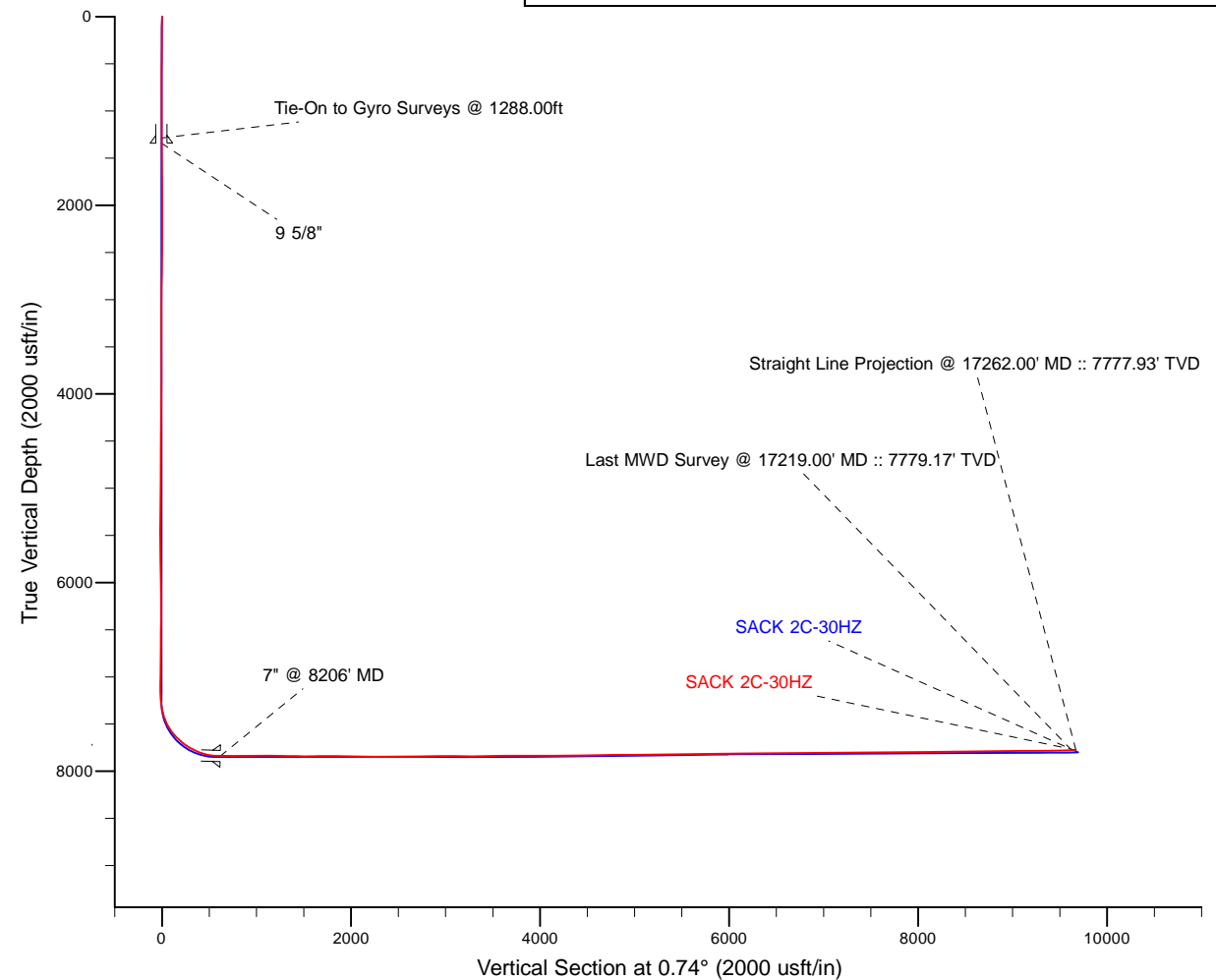
Examples of Survey Types:	TieOn	Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)
	MWD	Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's
	ESS	Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's
	Gyro	Gyro Survey's ; Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)
	SS	Single Shot (SS) Survey's ; Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.

Project: Weld County, CO (NAD 83)
 Site: Sec. 31-T1N-R67W
 Well: SACK 2C-30HZ
 Wellbore: Plan C
 Design: Actual Field Surveys



LEGEND

- SACK 2C-30HZ, Plan C, Rev C0 V0
- Actual Field Surveys



7" Casing: ~1498.16' FSL, ~1977.56' FEL
 Lat/Long: 40.004453 N, -104.930771 E
 State Planes - CO Northern: 1,244,980.83' N, 3,159,460.24' E
 Location: Sec. 31-T1N-R67W

BHL: ~25.14' FNL, ~1839.64' FEL
 Lat/Long: 40.029304 N, -104.930383 E
 State Planes - CO Northern: 1,254,033.70' N, 3,159,510.67' E
 Location: Sec. 30-T1N-R67W

WELL DETAILS: SACK 2C-30HZ	
Ground Level: 5040.00	
RKB = 16" @ 5056.00usft (Xtreme 22)	
Design: Actual Field Surveys (SACK 2C-30HZ/Plan C)	
Created By: Katie Benner	Date: 1/27/2015
Reviewed: _____	Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 31-T1N-R67W

SACK 2C-30HZ

API # 05-123-39427 JOB # 901558422

Plan C

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

27 January, 2015

Surface UWI : API # 05-123-39427 JOB # 901558422

Well Coordinates: 1,244,362.80 N, 3,159,555.06 E (40° 00' 09.92" N, 104° 55' 49.61" W)

Ground Level: 5,040.00 usft

Local Coordinate Origin:

Centered on Well SACK 2C-30HZ

Viewing Datum:

RKB = 16' @ 5056.00usft (Xtreme 22)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Design Report for SACK 2C-30HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SACK 2C-30HZ_SHL - SACK 2C-30HZ_SEC - SACK 2C-30HZ_LD							
16.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00
116.00	0.19	217.85	116.00	-0.13	-0.10	-0.13	0.19
216.00	0.11	132.38	216.00	-0.33	-0.13	-0.33	0.21
316.00	0.26	151.74	316.00	-0.59	0.05	-0.59	0.16
416.00	0.30	171.55	416.00	-1.05	0.19	-1.05	0.10
516.00	0.31	146.61	516.00	-1.53	0.38	-1.53	0.13
616.00	0.25	176.39	616.00	-1.98	0.54	-1.97	0.16
716.00	0.35	199.88	715.99	-2.48	0.45	-2.48	0.16
816.00	0.30	164.42	815.99	-3.02	0.42	-3.02	0.20
916.00	0.33	235.25	915.99	-3.44	0.25	-3.44	0.37
1,016.00	0.36	212.19	1,015.99	-3.87	-0.15	-3.87	0.14
1,116.00	0.15	170.16	1,115.99	-4.26	-0.30	-4.27	0.27
1,216.00	0.05	36.88	1,215.99	-4.36	-0.25	-4.36	0.19
1,288.00	0.07	317.96	1,287.99	-4.30	-0.26	-4.30	0.11
Tie-On to Gyro Surveys @ 1288.00ft							
1,344.00	0.38	326.85	1,343.99	-4.12	-0.38	-4.13	0.55
9 5/8"							
1,412.00	0.75	327.85	1,411.98	-3.56	-0.74	-3.57	0.55
1,491.00	0.84	326.78	1,490.98	-2.63	-1.33	-2.65	0.12
1,586.00	1.11	330.41	1,585.96	-1.25	-2.17	-1.28	0.29
1,677.00	1.06	336.11	1,676.95	0.28	-2.95	0.25	0.13
1,769.00	1.13	331.25	1,768.93	1.86	-3.73	1.81	0.13
1,860.00	1.05	338.65	1,859.91	3.42	-4.46	3.36	0.18
1,952.00	0.83	300.71	1,951.90	4.55	-5.34	4.48	0.70
2,134.00	0.93	243.56	2,133.88	4.56	-7.80	4.46	0.47
2,316.00	0.62	222.28	2,315.87	3.18	-9.78	3.05	0.23
2,499.00	1.05	228.42	2,498.85	1.33	-11.70	1.18	0.24
2,683.00	1.43	220.21	2,682.80	-1.54	-14.45	-1.73	0.23
2,866.00	0.87	186.09	2,865.77	-4.67	-16.07	-4.87	0.47
3,050.00	0.26	213.29	3,049.76	-6.41	-16.45	-6.62	0.35
3,234.00	0.25	170.73	3,233.76	-7.15	-16.61	-7.36	0.10
3,411.00	0.31	261.43	3,410.76	-7.60	-17.02	-7.82	0.23
3,581.00	0.55	266.55	3,580.75	-7.72	-18.29	-7.96	0.14
3,753.00	1.05	286.64	3,752.73	-7.32	-20.62	-7.58	0.33
3,924.00	1.08	275.32	3,923.70	-6.72	-23.73	-7.03	0.12
4,095.00	0.64	236.14	4,094.69	-7.10	-26.13	-7.44	0.42
4,266.00	0.48	193.79	4,265.68	-8.33	-27.09	-8.68	0.25
4,435.00	0.59	201.22	4,434.67	-9.83	-27.58	-10.19	0.08
4,607.00	0.57	172.83	4,606.66	-11.50	-27.79	-11.86	0.17
4,778.00	0.25	278.30	4,777.66	-12.29	-28.05	-12.66	0.40
4,947.00	0.80	255.02	4,946.65	-12.55	-29.56	-12.93	0.34
5,118.00	1.14	231.38	5,117.63	-13.92	-32.04	-14.33	0.30
5,289.00	0.68	193.41	5,288.61	-15.97	-33.60	-16.40	0.43
5,460.00	0.35	256.14	5,459.60	-17.08	-34.35	-17.52	0.35
5,631.00	0.31	295.12	5,630.60	-17.01	-35.27	-17.46	0.13
5,802.00	2.23	290.61	5,801.55	-15.64	-38.81	-16.14	1.12
5,973.00	5.18	286.17	5,972.17	-12.32	-49.34	-12.95	1.73
6,143.00	6.11	277.74	6,141.35	-8.96	-65.67	-9.81	0.73

Design Report for SACK 2C-30HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
6,313.00	3.94	267.97	6,310.69	-7.95	-80.48	-8.99	1.37
6,485.00	2.65	265.13	6,482.40	-8.50	-90.34	-9.66	0.76
6,656.00	1.00	213.57	6,653.32	-10.08	-95.11	-11.30	1.27
6,827.00	0.93	207.13	6,824.29	-12.55	-96.57	-13.80	0.08
6,997.00	0.28	262.83	6,994.28	-13.83	-97.61	-15.09	0.47
7,168.00	0.70	37.56	7,165.28	-13.06	-97.38	-14.31	0.54
7,210.00	1.08	30.96	7,207.27	-12.51	-97.02	-13.77	0.94
7,253.00	3.27	18.59	7,250.24	-11.00	-96.42	-12.25	5.18
7,296.00	7.75	18.34	7,293.03	-7.09	-95.12	-8.32	10.42
7,339.00	11.53	20.42	7,335.42	-0.31	-92.71	-1.50	8.83
7,382.00	14.83	13.77	7,377.28	9.07	-89.90	7.91	8.43
7,425.00	18.30	9.42	7,418.49	21.08	-87.48	19.95	8.56
7,468.00	21.82	5.17	7,458.88	35.70	-85.66	34.59	8.86
7,511.00	26.24	1.59	7,498.14	53.17	-84.67	52.07	10.82
7,553.00	30.84	359.48	7,535.03	73.23	-84.51	72.13	11.21
7,596.00	34.78	357.30	7,571.17	96.51	-85.19	95.40	9.56
7,639.00	39.61	356.66	7,605.41	122.46	-86.57	121.33	11.27
7,682.00	43.61	358.72	7,637.55	150.99	-87.70	149.84	9.83
7,724.00	48.01	0.48	7,666.82	181.09	-87.89	179.94	10.90
7,767.00	51.57	359.01	7,694.58	213.92	-88.05	212.77	8.68
7,810.00	54.12	357.36	7,720.55	248.17	-89.14	247.00	6.67
7,853.00	58.00	356.09	7,744.56	283.78	-91.19	282.58	9.35
7,895.00	62.21	357.03	7,765.48	320.11	-93.37	318.88	10.21
7,938.00	66.00	359.15	7,784.26	358.77	-94.64	357.51	9.87
7,981.00	69.69	359.66	7,800.47	398.58	-95.05	397.32	8.65
8,024.00	72.87	359.93	7,814.27	439.30	-95.20	438.04	7.42
8,066.00	76.49	0.35	7,825.37	479.80	-95.10	478.53	8.67
8,109.00	82.00	1.52	7,833.39	522.02	-94.41	520.76	13.09
8,158.00	86.61	2.29	7,838.25	570.74	-92.78	569.50	9.54
8,206.00	88.13	2.35	7,840.45	618.65	-90.84	617.43	3.17
7" @ 8206' MD							
8,330.00	92.06	2.51	7,840.25	742.51	-85.59	741.35	3.17
8,415.00	91.45	1.18	7,837.64	827.43	-82.85	826.29	1.72
8,501.00	90.49	359.92	7,836.19	913.41	-82.02	912.27	1.84
8,586.00	89.29	358.90	7,836.35	998.40	-82.90	997.25	1.85
8,759.00	89.26	358.55	7,838.54	1,171.34	-86.75	1,170.13	0.20
8,930.00	89.08	358.21	7,841.02	1,342.26	-91.58	1,340.96	0.22
9,099.00	90.18	358.21	7,842.11	1,511.17	-96.86	1,509.79	0.65
9,269.00	90.37	359.59	7,841.29	1,681.13	-100.13	1,679.70	0.82
9,440.00	89.17	359.27	7,841.98	1,852.12	-101.83	1,850.65	0.73
9,610.00	89.54	359.73	7,843.89	2,022.10	-103.31	2,020.60	0.35
9,787.00	88.98	358.79	7,846.18	2,199.07	-105.60	2,197.52	0.62
9,969.00	90.46	0.43	7,847.07	2,381.05	-106.83	2,379.47	1.21
10,061.00	90.37	0.84	7,846.40	2,473.04	-105.81	2,471.47	0.46
10,080.68	90.52	0.86	7,846.25	2,492.72	-105.52	2,491.15	0.78
SACK 2C-30HZ_Lateral Target 1							
10,152.00	91.08	0.91	7,845.25	2,564.02	-104.42	2,562.46	0.78
10,243.00	91.32	0.50	7,843.34	2,655.00	-103.31	2,653.44	0.52
10,334.00	89.69	358.77	7,842.54	2,745.99	-103.88	2,744.41	2.61
10,426.00	90.83	358.76	7,842.12	2,837.96	-105.87	2,836.36	1.24
10,517.00	89.94	359.56	7,841.51	2,928.95	-107.20	2,927.32	1.32

Design Report for SACK 2C-30HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
10,608.00	89.85	0.92	7,841.68	3,019.94	-106.82	3,018.31	1.50
10,694.00	89.85	1.64	7,841.90	3,105.92	-104.90	3,104.31	0.84
10,865.00	89.85	1.37	7,842.35	3,276.86	-100.41	3,275.29	0.16
11,035.00	91.69	2.22	7,840.07	3,446.76	-95.08	3,445.24	1.19
11,206.00	90.25	2.80	7,837.17	3,617.56	-87.60	3,616.13	0.91
11,377.00	89.66	2.23	7,837.31	3,788.40	-80.09	3,787.04	0.48
11,547.00	90.25	1.49	7,837.44	3,958.30	-74.58	3,957.01	0.56
11,589.97	90.33	1.51	7,837.22	4,001.26	-73.45	3,999.97	0.20
SACK 2C-30HZ_Lateral Target 2							
11,718.00	90.58	1.56	7,836.20	4,129.24	-70.02	4,127.99	0.20
11,889.00	90.34	0.41	7,834.83	4,300.20	-67.09	4,298.98	0.69
12,060.00	90.92	1.64	7,832.95	4,471.16	-64.03	4,469.96	0.80
12,231.00	90.77	0.64	7,830.43	4,642.11	-60.63	4,640.94	0.59
12,401.00	90.96	0.74	7,827.86	4,812.08	-58.58	4,810.92	0.13
12,568.00	89.94	0.88	7,826.55	4,979.05	-56.22	4,977.91	0.62
12,740.00	90.68	1.64	7,825.62	5,151.01	-52.44	5,149.90	0.62
12,911.00	91.36	1.29	7,822.57	5,321.92	-48.06	5,320.86	0.45
13,082.00	90.37	1.65	7,819.99	5,492.84	-43.68	5,491.82	0.62
13,253.00	90.59	1.40	7,818.56	5,663.78	-39.13	5,662.80	0.19
13,424.00	91.48	359.43	7,815.47	5,834.73	-37.89	5,833.76	1.26
13,590.19	89.70	359.01	7,813.76	6,000.89	-40.15	5,999.87	1.10
SACK 2C-30HZ_Lateral Target 3							
13,597.00	89.63	358.99	7,813.80	6,007.70	-40.27	6,006.68	1.10
13,768.00	90.25	0.85	7,813.98	6,178.69	-40.51	6,177.65	1.15
13,939.00	91.42	1.96	7,811.48	6,349.62	-36.32	6,348.62	0.94
14,110.00	90.49	1.83	7,808.63	6,520.50	-30.67	6,519.56	0.55
14,281.00	89.51	0.07	7,808.63	6,691.47	-27.83	6,690.55	1.18
14,452.00	90.95	0.69	7,807.95	6,862.46	-26.70	6,861.54	0.92
14,622.00	89.88	0.91	7,806.72	7,032.43	-24.32	7,031.53	0.64
14,794.00	90.52	0.84	7,806.11	7,204.41	-21.70	7,203.53	0.37
14,964.00	90.77	0.97	7,804.20	7,374.38	-19.01	7,373.52	0.17
15,136.00	90.46	1.35	7,802.36	7,546.33	-15.53	7,545.50	0.29
15,307.00	90.62	0.97	7,800.74	7,717.29	-12.07	7,716.49	0.24
15,478.00	90.92	1.74	7,798.45	7,888.22	-8.03	7,887.46	0.48
15,648.00	90.89	1.64	7,795.76	8,058.13	-3.01	8,057.42	0.06
15,819.00	90.62	2.48	7,793.51	8,229.00	3.13	8,228.36	0.52
15,990.00	89.69	2.01	7,793.04	8,399.87	9.83	8,399.29	0.61
16,161.00	91.70	2.43	7,790.97	8,570.72	16.45	8,570.22	1.20
16,333.00	90.77	1.86	7,787.26	8,742.56	22.89	8,742.12	0.63
16,504.00	90.34	0.81	7,785.61	8,913.50	26.87	8,913.10	0.66
16,674.00	90.22	359.86	7,784.78	9,083.49	27.87	9,083.09	0.56
16,845.00	90.25	359.69	7,784.07	9,254.49	27.20	9,254.07	0.10
17,017.00	90.49	358.15	7,782.96	9,426.45	23.95	9,425.97	0.91
17,219.00	91.66	358.82	7,779.17	9,628.34	18.62	9,627.78	0.67
Last MWD Survey @ 17219.00' MD :: 7779.17' TVD							
17,262.00	91.66	358.82	7,777.93	9,671.31	17.73	9,670.73	0.00
Straight Line Projection @ 17262.00' MD :: 7777.93' TVD - Current MWD Survey @ 8216' MD :: 7839.85' TVD - SACK 2C-3							

Design Report for SACK 2C-30HZ - Actual Field Surveys**Design Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,288.00	1,287.99	-4.30	-0.26	Tie-On to Gyro Surveys @ 1288.00ft
17,219.00	7,779.17	9,628.34	18.62	Last MWD Survey @ 17219.00' MD :: 7779.17' TVD
17,262.00	7,777.93	9,671.31	17.73	Straight Line Projection @ 17262.00' MD :: 7777.93' TVD
17,262.00	7,777.93	9,671.31	17.73	Current MWD Survey @ 8216' MD :: 7839.85' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.74	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
16.00	1,288.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,412.00	8,158.00	MWD Vertical/Build Surveys	MWD+IFR1
8,330.00	17,262.00	MWD Lateral Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,344.00	1,343.99	9 5/8"	9-5/8	13-1/2
8,206.00	7,840.45	7" @ 8206' MD	7	8-3/4

Design Report for SACK 2C-30HZ - Actual Field Surveys**Wellbore Targets**

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
SACK 2C-30HZ_SEC	0.00	0.00	0.00	0.01	0.00	1,244,362.81	3,159,555.06	40.002755	-104.930446
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	9,726.78	-3,399.80	1,254,067.22	3,156,092.97	
Point 2				0.00	9,703.58	-786.75	1,254,060.80	3,158,706.03	
Point 3				0.00	9,680.14	1,857.45	1,254,054.35	3,161,350.23	
Point 4				0.00	7,033.77	1,853.95	1,251,408.10	3,161,363.73	
Point 5				0.00	4,399.18	1,865.69	1,248,773.73	3,161,392.39	
Point 6				0.00	4,407.67	-771.47	1,248,765.28	3,158,755.32	
Point 7				0.00	4,416.15	-3,394.63	1,248,756.91	3,156,132.25	
Point 8				0.00	4,407.67	-771.47	1,248,765.28	3,158,755.32	
Point 9				0.00	4,399.18	1,865.69	1,248,773.73	3,161,392.39	
Point 10				0.00	1,759.45	1,882.63	1,246,134.25	3,161,426.28	
Point 11				0.00	-879.73	1,892.26	1,243,495.28	3,161,452.86	
Point 12				0.00	-879.52	-747.74	1,243,478.53	3,158,813.01	
Point 13				0.00	-879.24	-3,387.11	1,243,461.86	3,156,173.78	
Point 14				0.00	-879.52	-747.74	1,243,478.53	3,158,813.01	
Point 15				0.00	-879.73	1,892.26	1,243,495.28	3,161,452.86	
Point 16				0.00	-880.51	2,330.57	1,243,497.31	3,161,891.15	
Point 17				0.00	-3,338.86	2,337.98	1,241,039.14	3,161,914.35	
Point 18				0.00	-5,980.22	2,353.20	1,238,398.03	3,161,946.54	
Point 19				0.00	-5,975.92	-279.29	1,238,385.42	3,159,314.16	
Point 20				0.00	-5,971.98	-2,740.74	1,238,373.55	3,156,852.82	
Point 21				0.00	-3,366.18	-2,763.16	1,240,979.06	3,156,813.67	
Point 22				0.00	-878.86	-2,771.31	1,243,466.19	3,156,789.54	
Point 23				0.00	-879.24	-3,387.11	1,243,461.86	3,156,173.78	
Point 24				0.00	4,416.15	-3,394.63	1,248,756.91	3,156,132.25	
SACK 2C-30HZ_LD	0.00	0.00	0.00	0.01	0.00	1,244,362.81	3,159,555.06	40.002755	-104.930446
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	10,159.58	-328.31	1,254,519.72	3,159,161.51	
Point 2				0.00	10,156.01	73.51	1,254,518.73	3,159,563.33	
Point 3				0.00	7,056.68	75.96	1,251,419.59	3,159,585.69	
Point 4				0.00	-419.57	109.94	1,243,943.96	3,159,667.68	
Point 5				0.00	-419.54	-290.64	1,243,941.42	3,159,267.13	
Point 6				0.00	4,406.18	-311.45	1,248,766.75	3,159,215.32	
SACK 2C-30HZ_SHL	0.00	0.00	0.00	0.01	0.00	1,244,362.81	3,159,555.06	40.002755	-104.930446
- actual wellpath misses target center by 0.01usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
SACK 2C-30HZ_TOE	0.00	0.00	7,802.00	9,695.51	23.10	1,254,057.93	3,159,515.88	40.029370	-104.930364
- actual wellpath misses target center by 34.56usft at 17262.00usft MD (7777.93 TVD, 9671.31 N, 17.73 E)									
- Point									
SACK 2C-30HZ_Later:	0.00	0.00	7,822.00	6,001.00	-37.58	1,250,363.23	3,159,478.94	40.019228	-104.930580
- actual wellpath misses target center by 8.64usft at 13590.30usft MD (7813.76 TVD, 6001.01 N, -40.16 E)									
- Point									
SACK 2C-30HZ_Later:	0.00	0.00	7,849.00	4,001.26	-70.51	1,248,363.39	3,159,458.85	40.013739	-104.930698
- actual wellpath misses target center by 12.14usft at 11589.97usft MD (7837.22 TVD, 4001.26 N, -73.45 E)									
- Point									
SACK 2C-30HZ_Later:	0.00	0.00	7,849.00	2,492.59	-95.00	1,246,854.65	3,159,444.05	40.009597	-104.930785
- actual wellpath misses target center by 10.88usft at 10080.68usft MD (7846.25 TVD, 2492.72 N, -105.52 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.07 °/100usft	Maximum Dogleg over Survey:	13.09 °/100usft at 8,109.00 usft
Net Tortosity applicable to Plans:	0.40 °/100usft	Directional Difficulty Index:	6.600

Design Report for SACK 2C-30HZ - Actual Field Surveys

Audit Info

North Reference Sheet for Sec. 31-T1N-R67W - SACK 2C-30HZ - Plan C

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' @ 5056.00usft (Xtreme 22). Northing and Easting are relative to SACK 2C-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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996616

Grid Coordinates of Well: 1,244,362.80 usft N, 3,159,555.06 usft E

Geographical Coordinates of Well: 40° 00' 09.92" N, 104° 55' 49.61" W

Grid Convergence at Surface is: 0.37°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,262.00usft the Bottom Hole Displacement is 9,671.33usft in the Direction of 0.11° (True).

Magnetic Convergence at surface is: -8.21° (18 September 2014, , BGGM2014)

Magnetic Model: BGGM2014
 Date: 18-Sep-14
 Declination: 8.57°
 Inclination/Dip: 66.59°
 Field Strength: 52454

Grid North is 0.37° East of True North (Grid Convergence)
 Magnetic North is 8.57° East of True North (Magnetic Declination)
 Magnetic North is 8.21° East of Grid North (Magnetic Convergence)

To convert a True Direction to a Grid Direction, Subtract 0.37°
 To convert a Magnetic Direction to a True Direction, Add 8.57° East
 To convert a Magnetic Direction to a Grid Direction, Add 8.21°

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 31-T1N-R67W

SACK 2C-30HZ

API # 05-123-39427 JOB # 901558422

Plan C

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

27 January, 2015

Well Coordinates: 1,244,362.80 N, 3,159,555.06 E (40° 00' 09.92" N, 104° 55' 49.61" W)

Ground Level: 5,040.00 usft

Local Coordinate Origin:

Centered on Well SACK 2C-30HZ

Viewing Datum:

RKB = 16' @ 5056.00usft (Xtreme 22)

TVDs to System:

N

North Reference:

True

Unit System:

Dec-Deg - API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Design Report for SACK 2C-30HZ - Actual Field Surveys

Measured			Vertical	Local Coordinates		Geographic Coordinates		UTM Coordinates	
Depth (usft)	Inclination (°)	Azimuth (°)	Depth (usft)	+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40.002755	-104.930446	1,244,362.80	3,159,555.06
16.00	0.00	0.00	16.00	0.00	0.00	40.002755	-104.930446	1,244,362.80	3,159,555.06
116.00	0.19	217.85	116.00	-0.13	-0.10	40.002755	-104.930447	1,244,362.67	3,159,554.95
216.00	0.11	132.38	216.00	-0.33	-0.13	40.002754	-104.930447	1,244,362.47	3,159,554.93
316.00	0.26	151.74	316.00	-0.59	0.05	40.002753	-104.930446	1,244,362.21	3,159,555.11
416.00	0.30	171.55	416.00	-1.05	0.19	40.002752	-104.930446	1,244,361.75	3,159,555.25
516.00	0.31	146.61	516.00	-1.53	0.38	40.002751	-104.930445	1,244,361.27	3,159,555.44
616.00	0.25	176.39	616.00	-1.98	0.54	40.002750	-104.930444	1,244,360.82	3,159,555.61
716.00	0.35	199.88	715.99	-2.48	0.45	40.002748	-104.930445	1,244,360.32	3,159,555.52
816.00	0.30	164.42	815.99	-3.02	0.42	40.002747	-104.930445	1,244,359.78	3,159,555.49
916.00	0.33	235.25	915.99	-3.44	0.25	40.002746	-104.930445	1,244,359.36	3,159,555.33
1,016.00	0.36	212.19	1,015.99	-3.87	-0.15	40.002744	-104.930447	1,244,358.93	3,159,554.93
1,116.00	0.15	170.16	1,115.99	-4.26	-0.30	40.002743	-104.930447	1,244,358.53	3,159,554.79
1,216.00	0.05	36.88	1,215.99	-4.36	-0.25	40.002743	-104.930447	1,244,358.44	3,159,554.84
1,288.00	0.07	317.96	1,287.99	-4.30	-0.26	40.002743	-104.930447	1,244,358.50	3,159,554.82
1,344.00	0.38	326.85	1,343.99	-4.12	-0.38	40.002744	-104.930448	1,244,358.67	3,159,554.70
1,412.00	0.75	327.85	1,411.98	-3.56	-0.74	40.002745	-104.930449	1,244,359.24	3,159,554.34
1,491.00	0.84	326.78	1,490.98	-2.63	-1.33	40.002748	-104.930451	1,244,360.15	3,159,553.74
1,586.00	1.11	330.41	1,585.96	-1.25	-2.17	40.002752	-104.930454	1,244,361.53	3,159,552.89
1,677.00	1.06	336.11	1,676.95	0.28	-2.95	40.002756	-104.930457	1,244,363.06	3,159,552.11
1,769.00	1.13	331.25	1,768.93	1.86	-3.73	40.002760	-104.930460	1,244,364.63	3,159,551.32
1,860.00	1.05	338.65	1,859.91	3.42	-4.46	40.002764	-104.930462	1,244,366.19	3,159,550.57
1,952.00	0.83	300.71	1,951.90	4.55	-5.34	40.002768	-104.930465	1,244,367.31	3,159,549.68
2,134.00	0.93	243.56	2,133.88	4.56	-7.80	40.002768	-104.930474	1,244,367.31	3,159,547.23
2,316.00	0.62	222.28	2,315.87	3.18	-9.78	40.002764	-104.930481	1,244,365.91	3,159,545.25
2,499.00	1.05	228.42	2,498.85	1.33	-11.70	40.002759	-104.930488	1,244,364.05	3,159,543.34
2,683.00	1.43	220.21	2,682.80	-1.54	-14.45	40.002751	-104.930498	1,244,361.16	3,159,540.62
2,866.00	0.87	186.09	2,865.77	-4.67	-16.07	40.002742	-104.930504	1,244,358.03	3,159,539.02
3,050.00	0.26	213.29	3,049.76	-6.41	-16.45	40.002737	-104.930505	1,244,356.29	3,159,538.65
3,234.00	0.25	170.73	3,233.76	-7.15	-16.61	40.002735	-104.930506	1,244,355.54	3,159,538.49
3,411.00	0.31	261.43	3,410.76	-7.60	-17.02	40.002734	-104.930507	1,244,355.09	3,159,538.08
3,581.00	0.55	266.55	3,580.75	-7.72	-18.29	40.002734	-104.930512	1,244,354.96	3,159,536.82
3,753.00	1.05	286.64	3,752.73	-7.32	-20.62	40.002735	-104.930520	1,244,355.35	3,159,534.48
3,924.00	1.08	275.32	3,923.32	-6.72	-23.73	40.002737	-104.930531	1,244,355.92	3,159,531.37
4,095.00	0.64	236.14	4,094.69	-7.10	-26.13	40.002736	-104.930540	1,244,355.53	3,159,528.97
4,266.00	0.48	193.79	4,265.68	-8.33	-27.09	40.002732	-104.930543	1,244,354.29	3,159,528.02
4,435.00	0.59	201.22	4,434.67	-9.83	-27.58	40.002728	-104.930545	1,244,352.79	3,159,527.54
4,607.00	0.57	172.83	4,606.66	-11.50	-27.79	40.002723	-104.930545	1,244,351.12	3,159,527.34
4,778.00	0.25	278.30	4,777.66	-12.29	-28.05	40.002721	-104.930546	1,244,350.32	3,159,527.08
4,947.00	0.80	255.02	4,946.65	-12.55	-29.56	40.002721	-104.930552	1,244,350.06	3,159,525.58
5,118.00	1.14	231.38	5,117.63	-13.92	-32.04	40.002717	-104.930561	1,244,348.68	3,159,523.11
5,289.00	0.68	193.41	5,288.61	-15.97	-33.60	40.002711	-104.930566	1,244,346.62	3,159,521.56

Design Report for SACK 2C-30HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
5,460.00	0.35	256.14	5,459.60	-17.08	-34.35	40.002708	-104.930569	1,244,345.50	3,159,520.82
5,631.00	0.31	295.12	5,630.60	-17.01	-35.27	40.002708	-104.930572	1,244,345.57	3,159,519.90
5,802.00	2.23	290.61	5,801.55	-15.64	-38.81	40.002712	-104.930585	1,244,346.91	3,159,516.35
5,973.00	5.18	286.17	5,972.17	-12.32	-49.34	40.002721	-104.930622	1,244,350.16	3,159,505.80
6,143.00	6.11	277.74	6,141.35	-8.96	-65.67	40.002730	-104.930681	1,244,353.41	3,159,489.45
6,313.00	3.94	267.97	6,310.69	-7.95	-80.48	40.002733	-104.930734	1,244,354.33	3,159,474.64
6,485.00	2.65	265.13	6,482.40	-8.50	-90.34	40.002732	-104.930769	1,244,353.72	3,159,464.77
6,656.00	1.00	213.57	6,653.32	-10.08	-95.11	40.002727	-104.930786	1,244,352.11	3,159,460.02
6,827.00	0.93	207.13	6,824.29	-12.55	-96.57	40.002721	-104.930791	1,244,349.62	3,159,458.58
6,997.00	0.28	262.83	6,994.28	-13.83	-97.61	40.002717	-104.930795	1,244,348.34	3,159,457.54
7,168.00	0.70	37.56	7,165.28	-13.06	-97.38	40.002719	-104.930794	1,244,349.12	3,159,457.76
7,210.00	1.08	30.96	7,207.27	-12.51	-97.02	40.002721	-104.930793	1,244,349.66	3,159,458.12
7,253.00	3.27	18.59	7,250.24	-11.00	-96.42	40.002725	-104.930790	1,244,351.17	3,159,458.71
7,296.00	7.75	18.34	7,293.03	-7.09	-95.12	40.002736	-104.930786	1,244,355.10	3,159,459.99
7,339.00	11.53	20.42	7,335.42	-0.31	-92.71	40.002754	-104.930777	1,244,361.90	3,159,462.35
7,382.00	14.83	13.77	7,377.28	9.07	-89.90	40.002780	-104.930767	1,244,371.29	3,159,465.10
7,425.00	18.30	9.42	7,418.49	21.08	-87.48	40.002813	-104.930759	1,244,383.31	3,159,467.44
7,468.00	21.82	5.17	7,458.88	35.70	-85.66	40.002853	-104.930752	1,244,397.95	3,159,469.17
7,511.00	26.24	1.59	7,498.14	53.17	-84.67	40.002901	-104.930749	1,244,415.42	3,159,470.05
7,553.00	30.84	359.48	7,535.03	73.23	-84.51	40.002956	-104.930748	1,244,435.48	3,159,470.08
7,596.00	34.78	357.30	7,571.17	96.51	-85.19	40.003020	-104.930750	1,244,458.76	3,159,469.25
7,639.00	39.61	356.66	7,605.41	122.46	-86.57	40.003091	-104.930755	1,244,484.70	3,159,467.71
7,682.00	43.61	358.72	7,637.55	150.99	-87.70	40.003170	-104.930759	1,244,513.21	3,159,466.39
7,724.00	48.01	0.48	7,666.82	181.09	-87.89	40.003252	-104.930760	1,244,543.31	3,159,466.01
7,767.00	51.57	359.01	7,694.58	213.92	-88.05	40.003342	-104.930761	1,244,576.14	3,159,465.64
7,810.00	54.12	357.36	7,720.55	248.17	-89.14	40.003436	-104.930764	1,244,610.38	3,159,464.33
7,853.00	58.00	356.09	7,744.56	283.78	-91.19	40.003534	-104.930772	1,244,645.97	3,159,462.05
7,895.00	62.21	357.03	7,765.48	320.11	-93.37	40.003634	-104.930780	1,244,682.29	3,159,459.64
7,938.00	66.00	359.15	7,784.26	358.77	-94.64	40.003740	-104.930784	1,244,720.94	3,159,458.11
7,981.00	69.69	359.66	7,800.47	398.58	-95.05	40.003849	-104.930786	1,244,760.75	3,159,457.45
8,024.00	72.87	359.93	7,814.27	439.30	-95.20	40.003961	-104.930786	1,244,801.46	3,159,457.04
8,066.00	76.49	0.35	7,825.37	479.80	-95.10	40.004072	-104.930786	1,244,841.96	3,159,456.88
8,109.00	82.00	1.52	7,833.39	522.02	-94.41	40.004188	-104.930783	1,244,884.19	3,159,457.30
8,158.00	86.61	2.29	7,838.25	570.74	-92.78	40.004322	-104.930777	1,244,932.91	3,159,458.61
8,206.00	88.13	2.35	7,840.45	618.65	-90.84	40.004453	-104.930771	1,244,980.83	3,159,460.24
8,330.00	92.06	2.51	7,840.25	742.51	-85.59	40.004793	-104.930752	1,245,104.72	3,159,464.71
8,415.00	91.45	1.18	7,837.64	827.43	-82.85	40.005026	-104.930742	1,245,189.65	3,159,466.90
8,501.00	90.49	359.92	7,836.19	913.41	-82.02	40.005262	-104.930739	1,245,275.63	3,159,467.17
8,586.00	89.29	358.90	7,836.35	998.40	-82.90	40.005496	-104.930742	1,245,360.61	3,159,465.75
8,759.00	89.26	358.55	7,838.54	1,171.34	-86.75	40.005970	-104.930756	1,245,533.52	3,159,460.79
8,930.00	89.08	358.21	7,841.02	1,342.26	-91.58	40.006440	-104.930773	1,245,704.39	3,159,454.86
9,099.00	90.18	358.21	7,842.11	1,511.17	-96.86	40.006903	-104.930792	1,245,873.26	3,159,448.49

Design Report for SACK 2C-30HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
9,269.00	90.37	359.59	7,841.29	1,681.13	-100.13	40.007370	-104.930804	1,246,043.20	3,159,444.14
9,440.00	89.17	359.27	7,841.98	1,852.12	-101.83	40.007839	-104.930810	1,246,214.16	3,159,441.34
9,610.00	89.54	359.73	7,843.89	2,022.10	-103.31	40.008306	-104.930815	1,246,384.12	3,159,438.76
9,787.00	88.98	358.79	7,846.18	2,199.07	-105.60	40.008792	-104.930823	1,246,561.07	3,159,435.34
9,969.00	90.46	0.43	7,847.07	2,381.05	-106.83	40.009291	-104.930828	1,246,743.03	3,159,432.94
10,061.00	90.37	0.84	7,846.40	2,473.04	-105.81	40.009544	-104.930824	1,246,835.03	3,159,433.36
10,080.68	90.52	0.86	7,846.25	2,492.72	-105.52	40.009598	-104.930823	1,246,854.70	3,159,433.53
10,152.00	91.08	0.91	7,845.25	2,564.02	-104.42	40.009794	-104.930819	1,246,926.01	3,159,434.17
10,243.00	91.32	0.50	7,843.34	2,655.00	-103.31	40.010043	-104.930815	1,247,016.99	3,159,434.70
10,334.00	89.69	358.77	7,842.54	2,745.99	-103.88	40.010293	-104.930817	1,247,107.97	3,159,433.54
10,426.00	90.83	358.76	7,842.12	2,837.96	-105.87	40.010546	-104.930824	1,247,199.92	3,159,430.97
10,517.00	89.94	359.56	7,841.51	2,928.95	-107.20	40.010795	-104.930829	1,247,290.90	3,159,429.05
10,608.00	89.85	0.92	7,841.68	3,019.94	-106.82	40.011045	-104.930828	1,247,381.89	3,159,428.84
10,694.00	89.85	1.64	7,841.90	3,105.92	-104.90	40.011281	-104.930821	1,247,467.88	3,159,430.21
10,865.00	89.85	1.37	7,842.35	3,276.86	-100.41	40.011750	-104.930805	1,247,638.84	3,159,433.61
11,035.00	91.69	2.22	7,840.07	3,446.76	-95.08	40.012217	-104.930786	1,247,808.75	3,159,437.84
11,206.00	90.25	2.80	7,837.17	3,617.56	-87.60	40.012686	-104.930759	1,247,979.60	3,159,444.23
11,377.00	89.66	2.23	7,837.31	3,788.40	-80.09	40.013155	-104.930732	1,248,150.47	3,159,450.64
11,547.00	90.25	1.49	7,837.44	3,958.30	-74.58	40.013621	-104.930713	1,248,320.41	3,159,455.06
11,589.97	90.33	1.51	7,837.22	4,001.26	-73.45	40.013739	-104.930708	1,248,363.36	3,159,455.91
11,718.00	90.58	1.56	7,836.20	4,129.24	-70.02	40.014090	-104.930696	1,248,491.36	3,159,458.51
11,889.00	90.34	0.41	7,834.83	4,300.20	-67.09	40.014560	-104.930686	1,248,662.34	3,159,460.36
12,060.00	90.92	1.64	7,832.95	4,471.16	-64.03	40.015029	-104.930675	1,248,833.31	3,159,462.32
12,231.00	90.77	0.64	7,830.43	4,642.11	-60.63	40.015498	-104.930663	1,249,004.26	3,159,464.62
12,401.00	90.96	0.74	7,827.86	4,812.08	-58.58	40.015965	-104.930655	1,249,174.24	3,159,465.57
12,568.00	89.94	0.88	7,826.55	4,979.05	-56.22	40.016423	-104.930647	1,249,341.22	3,159,466.86
12,740.00	90.68	1.64	7,825.62	5,151.01	-52.44	40.016895	-104.930633	1,249,513.19	3,159,469.54
12,911.00	91.36	1.29	7,822.57	5,321.92	-48.06	40.017364	-104.930618	1,249,684.12	3,159,472.81
13,082.00	90.37	1.65	7,819.99	5,492.84	-43.68	40.017833	-104.930602	1,249,855.06	3,159,476.10
13,253.00	90.59	1.40	7,818.56	5,663.78	-39.13	40.018303	-104.930586	1,250,026.01	3,159,479.55
13,424.00	91.48	359.43	7,815.47	5,834.73	-37.89	40.018772	-104.930582	1,250,196.97	3,159,479.69
13,590.19	89.70	359.01	7,813.76	6,000.89	-40.15	40.019228	-104.930590	1,250,363.10	3,159,476.36
13,597.00	89.63	358.99	7,813.80	6,007.70	-40.27	40.019247	-104.930590	1,250,369.91	3,159,476.20
13,768.00	90.25	0.85	7,813.98	6,178.69	-40.51	40.019716	-104.930591	1,250,540.89	3,159,474.86
13,939.00	91.42	1.96	7,811.48	6,349.62	-36.32	40.020185	-104.930576	1,250,711.84	3,159,477.96
14,110.00	90.49	1.83	7,808.63	6,520.50	-30.67	40.020654	-104.930556	1,250,882.74	3,159,482.51
14,281.00	89.51	0.07	7,808.63	6,691.47	-27.83	40.021124	-104.930546	1,251,053.72	3,159,484.25
14,452.00	90.95	0.69	7,807.95	6,862.46	-26.70	40.021593	-104.930542	1,251,224.71	3,159,484.28
14,622.00	89.88	0.91	7,806.72	7,032.43	-24.32	40.022060	-104.930533	1,251,394.69	3,159,485.57
14,794.00	90.52	0.84	7,806.11	7,204.41	-21.70	40.022532	-104.930524	1,251,566.68	3,159,487.09
14,964.00	90.77	0.97	7,804.20	7,374.38	-19.01	40.022998	-104.930514	1,251,736.65	3,159,488.68
15,136.00	90.46	1.35	7,802.36	7,546.33	-15.53	40.023470	-104.930502	1,251,908.62	3,159,491.06

Design Report for SACK 2C-30HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates		Geographic Coordinates		UTM Coordinates	
				+N/-S (usft)	+E/-W (usft)	Latitude (usft)	Longitude (usft)	Northing (usft)	Easting (usft)
15,307.00	90.62	0.97	7,800.74	7,717.29	-12.07	40.023940	-104.930489	1,252,079.59	3,159,493.42
15,478.00	90.92	1.74	7,798.45	7,888.22	-8.03	40.024409	-104.930475	1,252,250.54	3,159,496.37
15,648.00	90.89	1.64	7,795.76	8,058.13	-3.01	40.024875	-104.930457	1,252,420.47	3,159,500.29
15,819.00	90.62	2.48	7,793.51	8,229.00	3.13	40.025344	-104.930435	1,252,591.37	3,159,505.34
15,990.00	89.69	2.01	7,793.04	8,399.87	9.83	40.025813	-104.930411	1,252,762.27	3,159,510.94
16,161.00	91.70	2.43	7,790.97	8,570.72	16.45	40.026282	-104.930388	1,252,933.15	3,159,516.46
16,333.00	90.77	1.86	7,787.26	8,742.56	22.89	40.026754	-104.930365	1,253,105.02	3,159,521.79
16,504.00	90.34	0.81	7,785.61	8,913.50	26.87	40.027223	-104.930350	1,253,275.98	3,159,524.68
16,674.00	90.22	359.86	7,784.78	9,083.49	27.87	40.027690	-104.930347	1,253,445.97	3,159,524.58
16,845.00	90.25	359.69	7,784.07	9,254.49	27.20	40.028159	-104.930349	1,253,616.96	3,159,522.81
17,017.00	90.49	358.15	7,782.96	9,426.45	23.95	40.028631	-104.930361	1,253,788.89	3,159,518.47
17,219.00	91.66	358.82	7,779.17	9,628.34	18.62	40.029186	-104.930380	1,253,990.73	3,159,511.83
17,262.00	91.66	358.82	7,777.93	9,671.31	17.73	40.029304	-104.930383	1,254,033.70	3,159,510.67

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,288.00	1,287.99	-4.30	-0.26	Tie-On to Gyro Surveys @ 1288.00ft
17,219.00	7,779.17	9,628.34	18.62	Last MWD Survey @ 17219.00' MD :: 7779.17' TVD
17,262.00	7,777.93	9,671.31	17.73	Straight Line Projection @ 17262.00' MD :: 7777.93' TVD
17,262.00	7,777.93	9,671.31	17.73	Current MWD Survey @ 8216' MD :: 7839.85' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.74	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
16.00	1,288.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,412.00	8,158.00	MWD Vertical/Build Surveys	MWD+IFR1
8,330.00	17,262.00	MWD Lateral Surveys	MWD+IFR1+SC

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Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,344.00	1,343.99	9 5/8"	9-5/8	13-1/2
8,206.00	7,840.45	7" @ 8206' MD	7	8-3/4

Design Targets

Shape	Target Name	TVD (')	Northing (')	Easting (')	+N/-S	+E/-W	Created	Updated

Directional Difficulty Index

Average Dogleg over Survey:	1.07 °/100usft	Maximum Dogleg over Survey:	13.09 °/100usft at 8,109.00 usft
Net Tortosity applicable to Plans:	0.40 °/100usft	Directional Difficulty Index:	6.600

Audit Info

North Reference Sheet for Sec. 31-T1N-R67W - SACK 2C-30HZ - Plan C

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' @ 5056.00usft (Xtreme 22). Northing and Easting are relative to SACK 2C-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 -105.500000°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996616

Grid Coordinates of Well: 1,244,362.80 usft N, 3,159,555.06 usft E

Geographical Coordinates of Well: 40° 00' 09.92" N, 104° 55' 49.61" W

Grid Convergence at Surface is: 0.37°

Based upon Minimum Curvature type calculations, at a Measured Depth of 17,262.00usft

the Bottom Hole Displacement is 9,671.33usft in the Direction of 0.11° (True).

Magnetic Convergence at surface is: -8.21° (18 September 2014, , BGGM2014)

