

Project: Weld County, CO (NAD 83)
 Site: Sec. 2-T5N-R64W (Wolfpack 2 South PAD)
 Well: Wolfpack B02-62-1HN
 Wellbore: Plan A
 Design: Final Surveys

Noble Energy

HALLIBURTON
 Sperry Drilling

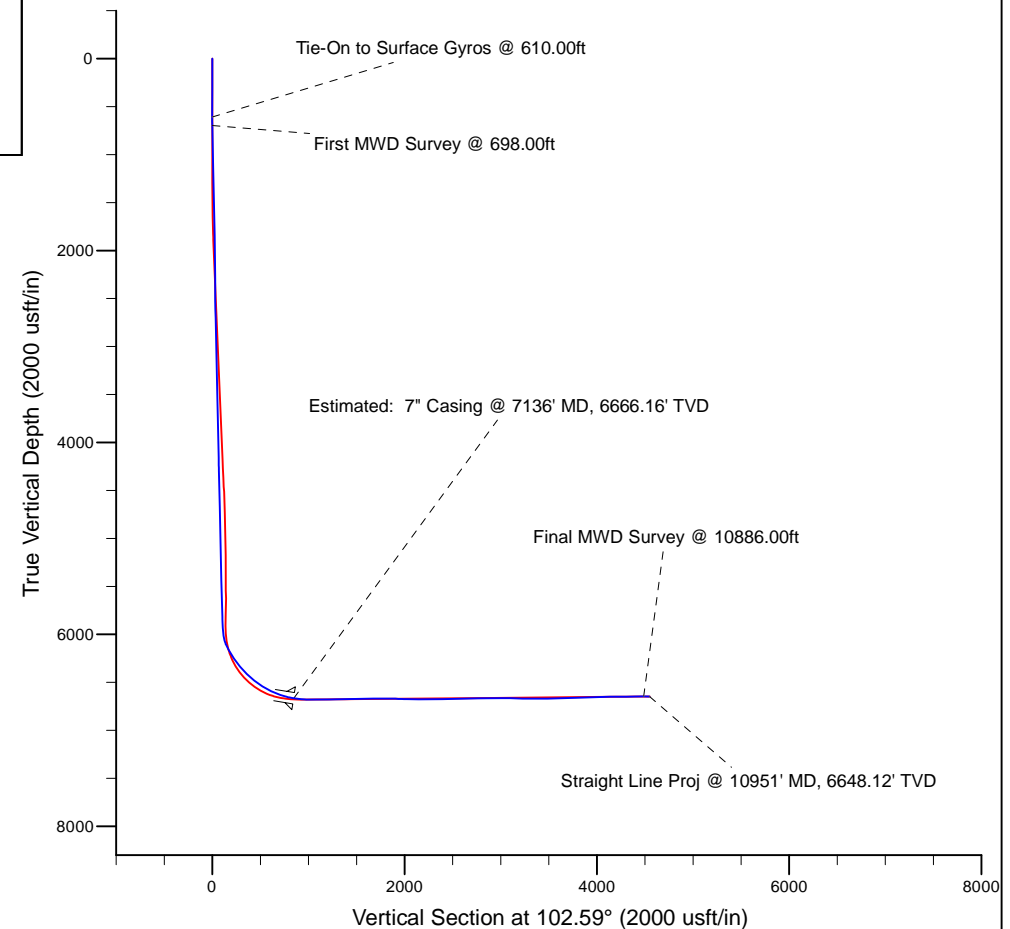
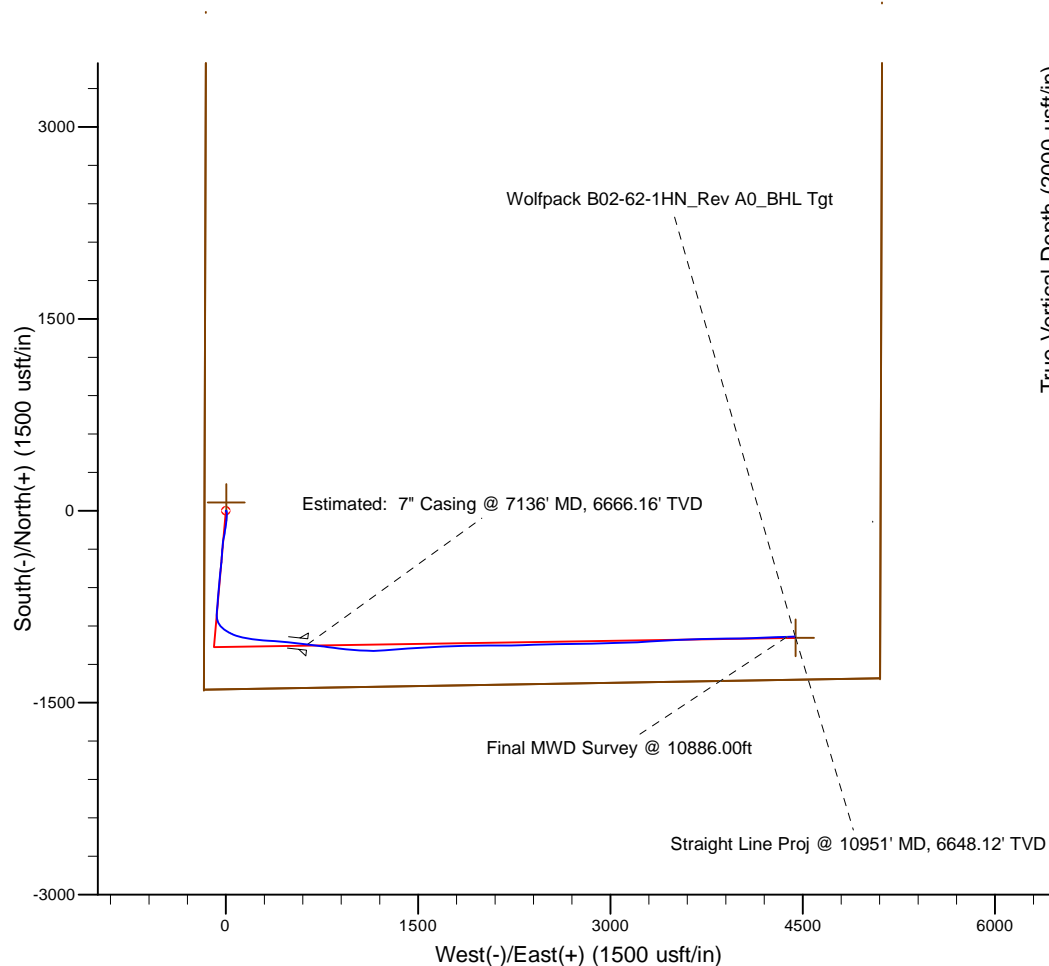
Platted SHL: 1395' FSL, 169' FWL
 Platted Lat/Long: 40.42491° N, 104.52636° W
 Location: Sec. 2-T5N-R64W

7" Casing: ~339.55' FSL, ~804.07' FWL
 Lat/Long: 40° 25' 19.288 N, 104° 31' 26.846 W
 State Planes - CO Northern: 1,398,078.88' N, 3,271,697.82' E
 Location: Sec. 2-T5N-R64W

BHL: ~338.15' FSL, ~661.07' FEL
 Lat/Long: 40° 25' 19.485 N, 104° 30' 37.606 W
 State Planes - CO Northern: 1,398,141.03' N, 3,275,505.53' E
 Location: Sec. 2-T5N-R64W

LEGEND

- Wolfpack B02-62-1HN, Plan A, Rev A0 Proposal V0
- Final Surveys



WELL DETAILS: Wolfpack B02-62-1HN

Ground Level: 4615.00
 KB=16" @ 4631.00usft (Precision 829)

Created By: Fred Hartmann
 Created On: 10/29/2013

Noble Energy

Weld County, CO (NAD 83)

Sec. 2-T5N-R64W (Wolfpack 2 South PAD)

Wolfpack B02-62-1HN - A4

Design: Final Surveys

Sperry Drilling Services

Final Survey Report

29 October, 2013

Well Coordinates: 1,399,123.19 N, 3,271,063.74 E (40° 25' 29.68" N, 104° 31' 34.90" W)

Ground Level: 4,615.00 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 Wolfpack B02-62-1HN - Slot A4

KB=16' @ 4631.00usft (Precision 829)

N

Grid

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Wolfpack B02-62-1HN - Final 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
310.00	0.00	110.40	310.00	0.00	0.00	0.00	0.00
610.00	0.20	216.80	610.00	-0.42	-0.31	-0.21	0.07
Tie-On to Surface Gyros @ 610.00ft							
698.00	1.36	62.05	697.99	-0.05	0.52	0.52	1.75
First MWD Survey @ 698.00ft							
787.00	0.83	115.39	786.98	0.17	2.03	1.95	1.23
876.00	0.92	122.68	875.97	-0.50	3.22	3.25	0.16
966.00	1.73	149.69	965.94	-2.06	4.51	4.85	1.11
1,056.00	3.20	169.47	1,055.86	-5.70	5.65	6.76	1.86
1,135.00	4.63	170.79	1,134.67	-11.02	6.57	8.81	1.81
1,229.00	6.50	175.93	1,228.23	-20.07	7.55	11.75	2.06
1,323.00	8.49	182.83	1,321.42	-32.31	7.59	14.45	2.32
1,417.00	10.72	187.87	1,414.10	-47.90	6.05	16.35	2.53
1,511.00	10.73	183.77	1,506.46	-65.29	4.28	18.41	0.81
1,606.00	10.45	181.72	1,599.84	-82.73	3.44	21.39	0.49
1,700.00	10.02	190.00	1,692.35	-99.31	1.76	23.37	1.63
1,794.00	9.54	187.85	1,784.98	-115.08	-0.72	24.38	0.64
1,888.00	10.17	190.43	1,877.60	-130.95	-3.29	25.34	0.82
1,983.00	10.32	189.17	1,971.08	-147.60	-6.17	26.17	0.28
2,077.00	9.73	186.92	2,063.65	-163.80	-8.46	27.45	0.75
2,171.00	9.77	190.62	2,156.29	-179.53	-10.89	28.51	0.67
2,279.00	9.11	189.38	2,262.83	-196.97	-13.97	29.31	0.64
2,368.00	9.95	191.73	2,350.60	-211.45	-16.68	29.82	1.04
2,458.00	9.49	193.49	2,439.31	-226.28	-20.00	29.82	0.61
2,547.00	10.06	184.57	2,527.02	-241.16	-22.33	30.79	1.82
2,637.00	10.59	184.99	2,615.56	-257.23	-23.67	32.98	0.59
2,727.00	11.31	186.94	2,703.92	-274.23	-25.46	34.95	0.90
2,816.00	9.48	184.80	2,791.46	-290.20	-27.13	36.80	2.10
2,906.00	9.44	185.70	2,880.23	-304.93	-28.48	38.69	0.17
2,996.00	8.48	181.76	2,969.13	-318.91	-29.42	40.83	1.27
3,086.00	7.46	181.90	3,058.26	-331.38	-29.81	43.16	1.13
3,175.00	8.54	186.78	3,146.40	-343.72	-30.79	44.90	1.43
3,265.00	10.16	185.21	3,235.20	-358.26	-32.30	46.60	1.82
3,354.00	8.77	184.02	3,322.99	-372.85	-33.48	48.62	1.58
3,444.00	7.25	182.24	3,412.11	-385.37	-34.19	50.66	1.71
3,534.00	8.84	184.52	3,501.22	-397.94	-34.95	52.65	1.80
3,624.00	11.19	185.79	3,589.84	-413.52	-36.38	54.66	2.62
3,713.00	12.29	186.94	3,676.98	-431.52	-38.40	56.61	1.26
3,803.00	11.84	187.66	3,764.99	-450.18	-40.78	58.35	0.53
3,893.00	10.03	184.26	3,853.35	-467.14	-42.60	60.28	2.13
3,982.00	9.65	185.50	3,941.04	-482.30	-43.89	62.33	0.49
4,072.00	9.12	185.29	4,029.84	-496.91	-45.27	64.17	0.59
4,162.00	8.50	186.04	4,118.77	-510.63	-46.63	65.83	0.70
4,251.00	9.62	187.11	4,206.66	-524.55	-48.24	67.29	1.27
4,341.00	11.53	183.49	4,295.13	-540.99	-49.72	69.43	2.25
4,430.00	11.61	183.96	4,382.32	-558.80	-50.88	72.19	0.14
4,520.00	9.45	186.68	4,470.80	-575.18	-52.36	74.31	2.46
4,610.00	8.41	186.96	4,559.71	-589.05	-54.02	75.72	1.16
4,699.00	9.12	182.11	4,647.67	-602.56	-55.07	77.64	1.15

Design Report for Wolfpack B02-62-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,789.00	7.93	183.56	4,736.68	-615.88	-55.72	79.91	1.34
4,879.00	9.43	187.82	4,825.64	-629.38	-57.10	81.50	1.81
4,968.00	11.23	186.21	4,913.20	-645.22	-59.03	83.07	2.05
5,058.00	10.49	186.23	5,001.58	-662.08	-60.87	84.95	0.82
5,148.00	8.64	186.25	5,090.33	-676.94	-62.50	86.61	2.06
5,238.00	8.67	180.94	5,179.31	-690.45	-63.34	88.72	0.89
5,327.00	9.26	182.22	5,267.22	-704.31	-63.73	91.37	0.70
5,417.00	9.68	185.48	5,355.99	-719.08	-64.73	93.61	0.76
5,506.00	10.24	184.75	5,443.65	-734.41	-66.10	95.62	0.64
5,596.00	8.73	182.47	5,532.42	-749.21	-67.06	97.91	1.73
5,686.00	9.97	187.45	5,621.22	-763.76	-68.37	99.81	1.64
5,775.00	10.65	184.81	5,708.79	-779.59	-70.05	101.61	0.93
5,865.00	10.66	181.25	5,797.23	-796.20	-70.93	104.38	0.73
5,910.00	9.50	181.82	5,841.54	-804.07	-71.14	105.89	2.59
5,955.00	9.36	181.03	5,885.93	-811.44	-71.33	107.32	0.42
6,000.00	14.47	176.58	5,929.95	-820.72	-71.06	109.60	11.53
6,044.00	17.70	178.53	5,972.22	-832.90	-70.56	112.75	7.44
6,089.00	21.65	172.99	6,014.59	-847.98	-69.37	117.20	9.70
6,134.00	24.52	157.84	6,056.02	-864.89	-64.83	125.31	14.61
6,179.00	29.11	145.61	6,096.20	-882.59	-55.11	138.66	15.90
6,224.00	32.35	138.26	6,134.89	-900.62	-40.90	156.45	11.01
6,269.00	33.54	131.63	6,172.66	-917.87	-23.59	177.11	8.43
6,313.00	34.24	125.94	6,209.20	-933.21	-4.48	199.11	7.38
6,358.00	35.18	120.04	6,246.20	-947.14	17.00	223.11	7.75
6,403.00	35.64	115.28	6,282.88	-959.23	40.08	248.27	6.21
6,448.00	36.70	112.23	6,319.21	-969.92	64.39	274.32	4.64
6,493.00	40.51	107.54	6,354.38	-979.41	90.79	302.15	10.67
6,538.00	45.14	102.74	6,387.38	-987.34	120.30	332.69	12.58
6,582.00	47.35	100.29	6,417.81	-993.67	151.44	364.46	6.43
6,627.00	49.56	99.55	6,447.66	-999.47	184.62	398.10	5.06
6,672.00	51.31	96.59	6,476.32	-1,004.33	218.96	432.67	6.39
6,717.00	52.56	95.60	6,504.07	-1,008.09	254.18	467.87	3.27
6,762.00	55.74	94.78	6,530.42	-1,011.38	290.50	504.03	7.22
6,806.00	59.06	94.40	6,554.12	-1,014.34	327.45	540.74	7.58
6,851.00	61.89	94.17	6,576.30	-1,017.27	366.49	579.48	6.30
6,896.00	64.74	94.52	6,596.50	-1,020.32	406.58	619.26	6.37
6,941.00	68.22	94.83	6,614.46	-1,023.68	447.70	660.13	7.76
6,986.00	71.10	95.30	6,630.10	-1,027.41	489.72	701.95	6.47
7,031.00	73.92	96.34	6,643.62	-1,031.76	532.41	744.57	6.64
7,075.00	76.58	97.32	6,654.82	-1,036.82	574.66	786.90	6.42
7,094.00	78.93	97.79	6,658.85	-1,039.26	593.06	805.39	12.60
7,136.00	81.02	96.34	6,666.16	-1,044.35	634.10	846.55	6.02
Estimated: 7" Casing @ 7136' MD, 6666.16' TVD							
7,163.00	82.36	95.41	6,670.07	-1,047.08	660.68	873.09	6.02
7,208.00	83.91	97.25	6,675.45	-1,052.01	705.08	917.49	5.32
7,298.00	89.11	98.29	6,680.92	-1,064.15	794.06	1,006.98	5.89
7,388.00	89.85	96.62	6,681.74	-1,075.83	883.29	1,096.61	2.03
7,477.00	91.48	95.39	6,680.71	-1,085.14	971.79	1,185.01	2.29
7,567.00	91.97	93.16	6,678.00	-1,091.84	1,061.49	1,274.02	2.54
7,657.00	91.60	89.16	6,675.19	-1,093.66	1,151.41	1,362.17	4.46
7,746.00	90.49	85.48	6,673.57	-1,089.50	1,240.28	1,448.00	4.32

Design Report for Wolfpack B02-62-1HN - Final Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
7,836.00	90.77	85.15	6,672.58	-1,082.15	1,329.98	1,533.93	0.48
7,925.00	90.00	86.30	6,671.98	-1,075.52	1,418.72	1,619.09	1.56
8,015.00	90.77	86.69	6,671.38	-1,070.02	1,508.55	1,705.56	0.96
8,105.00	89.42	87.00	6,671.23	-1,065.06	1,598.41	1,792.18	1.54
8,194.00	90.28	87.26	6,671.46	-1,060.61	1,687.30	1,877.96	1.01
8,284.00	87.41	87.86	6,673.28	-1,056.78	1,777.19	1,964.85	3.26
8,373.00	89.78	88.81	6,675.46	-1,054.19	1,866.12	2,051.08	2.87
8,463.00	90.89	90.13	6,674.93	-1,053.36	1,956.11	2,138.72	1.92
8,553.00	89.01	89.18	6,675.01	-1,052.82	2,046.10	2,226.43	2.34
8,642.00	89.14	90.29	6,676.45	-1,052.40	2,135.09	2,313.19	1.26
8,732.00	90.03	88.78	6,677.10	-1,051.67	2,225.08	2,400.85	1.95
8,822.00	92.19	87.29	6,675.36	-1,048.59	2,315.00	2,487.94	2.92
8,911.00	91.88	87.77	6,672.20	-1,044.76	2,403.87	2,573.83	0.64
9,001.00	92.56	89.78	6,668.71	-1,042.83	2,493.77	2,661.15	2.36
9,090.00	90.55	89.96	6,666.29	-1,042.63	2,582.73	2,747.93	2.27
9,180.00	90.83	87.63	6,665.21	-1,040.74	2,672.70	2,835.32	2.61
9,270.00	89.72	89.06	6,664.78	-1,038.14	2,762.66	2,922.54	2.01
9,360.00	90.28	89.29	6,664.78	-1,036.84	2,852.65	3,010.09	0.67
9,449.00	89.08	89.37	6,665.27	-1,035.80	2,941.64	3,096.71	1.35
9,539.00	88.77	87.69	6,666.96	-1,033.50	3,031.59	3,183.99	1.90
9,628.00	89.14	88.06	6,668.59	-1,030.20	3,120.52	3,270.06	0.59
9,718.00	88.95	86.73	6,670.09	-1,026.11	3,210.41	3,356.90	1.49
9,807.00	89.35	86.94	6,671.41	-1,021.19	3,299.26	3,442.54	0.51
9,897.00	90.09	86.50	6,671.85	-1,016.04	3,389.11	3,529.11	0.96
9,987.00	91.94	87.08	6,670.25	-1,011.01	3,478.95	3,615.69	2.15
10,076.00	93.17	86.68	6,666.28	-1,006.17	3,567.73	3,701.27	1.45
10,160.00	93.18	88.82	6,661.63	-1,002.87	3,651.53	3,782.34	2.54
10,254.00	93.06	88.89	6,656.52	-1,001.00	3,745.37	3,873.52	0.15
10,344.00	91.42	89.62	6,653.00	-999.83	3,835.29	3,961.02	1.99
10,434.00	89.78	89.05	6,652.06	-998.78	3,925.28	4,048.61	1.93
10,523.00	90.65	88.68	6,651.72	-997.02	4,014.26	4,135.07	1.06
10,613.00	90.15	88.17	6,651.09	-994.55	4,104.22	4,222.33	0.79
10,703.00	90.37	87.87	6,650.68	-991.44	4,194.17	4,309.43	0.41
10,792.00	91.73	88.31	6,649.05	-988.47	4,283.10	4,395.58	1.61
10,886.00	89.75	87.50	6,647.84	-985.04	4,377.03	4,486.49	2.28
Final MWD Survey @ 10886.00ft							
10,951.00	89.75	87.50	6,648.12	-982.20	4,441.96	4,549.25	0.00
Straight Line Proj @ 10951' MD, 6648.12' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
610.00	610.00	-0.42	-0.31	Tie-On to Surface Gyros @ 610.00ft
698.00	697.99	-0.05	0.52	First MWD Survey @ 698.00ft
10,886.00	6,647.84	-985.04	4,377.03	Final MWD Survey @ 10886.00ft
10,951.00	6,648.12	-982.20	4,441.96	Straight Line Proj @ 10951' MD, 6648.12' TVD

Design Report for Wolfpack B02-62-1HN - Final Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Wolfpack B02-62-1HN_Rev A0_BHL Tgt	102.59	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
310.00	610.00	Surface Gyros	Flexi-Shot
698.00	7,094.00	MWD Surveys - Vert/Build	MWD
7,163.00	10,886.00	MWD Surveys - Lateral	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,136.00	6,666.16	Estimated: 7" Casing @ 7136' MD, 6666.16' TVD	7	8-3/4

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
Wolfpack B02-64-1HN	0.00	0.00	-1.00	65.60	2.06	1,399,188.79	3,271,065.80	40° 25' 30.324 N	104° 31' 34.860 W
- actual wellpath misses target center by 65.64usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-1.00	-1,003.00	-633.00	1,398,185.83	3,270,432.83	
Point 2				-1.00	-1,089.00	-4,917.00	1,398,099.83	3,266,148.99	
Point 3				-1.00	3,266.00	-4,982.00	1,402,454.67	3,266,083.99	
Point 4				-1.00	3,375.00	-619.00	1,402,563.66	3,270,446.83	
Point 5				-1.00	-1,003.00	-633.00	1,398,185.83	3,270,432.83	
Wolfpack B02-64-1HN	0.00	0.00	-1.00	65.60	2.06	1,399,188.79	3,271,065.80	40° 25' 30.324 N	104° 31' 34.860 W
- actual wellpath misses target center by 65.64usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-1.00	-1,463.00	-173.00	1,397,725.85	3,270,892.81	
Point 2				-1.00	3,835.00	-159.00	1,403,023.64	3,270,906.81	
Point 3				-1.00	3,908.00	5,116.00	1,403,096.64	3,276,181.60	
Point 4				-1.00	-1,375.00	5,100.00	1,397,813.85	3,276,165.61	
Point 5				-1.00	-1,463.00	-173.00	1,397,725.85	3,270,892.81	
Wolfpack B02-64-1HN	0.00	0.00	-1.00	65.60	2.06	1,399,188.79	3,271,065.80	40° 25' 30.324 N	104° 31' 34.860 W
- actual wellpath misses target center by 65.64usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-1.00	-1,463.00	-173.00	1,397,725.85	3,270,892.81	
Point 2				-1.00	-1,549.00	-5,377.00	1,397,639.85	3,265,689.01	
Point 3				-1.00	3,726.00	-5,442.00	1,402,914.65	3,265,624.01	
Point 4				-1.00	3,835.00	-159.00	1,403,023.64	3,270,906.81	
Point 5				-1.00	-1,463.00	-173.00	1,397,725.85	3,270,892.81	
Wolfpack B02-64-1HN	0.00	0.00	-1.00	65.60	2.06	1,399,188.79	3,271,065.80	40° 25' 30.324 N	104° 31' 34.860 W
- actual wellpath misses target center by 65.64usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				-1.00	-1,003.00	287.00	1,398,185.83	3,271,352.79	
Point 2				-1.00	3,375.00	301.00	1,402,563.66	3,271,366.79	
Point 3				-1.00	3,448.00	4,656.00	1,402,636.66	3,275,721.62	
Point 4				-1.00	-915.00	4,640.00	1,398,273.83	3,275,705.62	
Point 5				-1.00	-1,003.00	287.00	1,398,185.83	3,271,352.79	
Wolfpack B02-62-1HN	0.00	0.00	6,648.35	-992.80	4,443.78	1,398,130.42	3,275,507.35	40° 25' 19.380 N	104° 30' 37.584 W
- actual wellpath misses target center by 10.76usft at 10951.00usft MD (6648.12 TVD, -982.20 N, 4441.96 E)									
- Point									

Design Report for Wolfpack B02-62-1HN - Final Surveys

Directional Difficulty Index

Average Dogleg over Survey:	2.16 °/100usft	Maximum Dogleg over Survey:	15.90 °/100usft at 6,179.00 usft
Net Tortosity applicable to Plans:	1.00 °/100usft	Directional Difficulty Index:	6.324

Audit Info

North Reference Sheet for Sec. 2-T5N-R64W (Wolfpack 2 South PAD) - Wolfpack
B02-62-1HN

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to KB=16' @ 4631.00usft (Precision 829). Northing and Easting are relative to Wolfpack B02-62-1HN - Slot A4

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° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996145

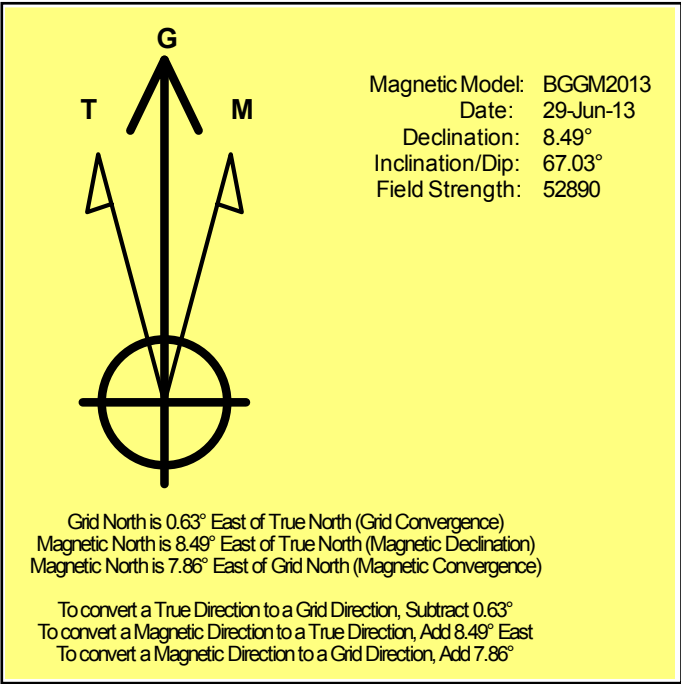
Grid Coordinates of Well: 1,399,123.19 usft N, 3,271,063.74 usft E

Geographical Coordinates of Well: 40° 25' 29.68" N, 104° 31' 34.90" W

Grid Convergence at Surface is: 0.63°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,951.00usft
the Bottom Hole Displacement is 4,549.26usft in the Direction of 102.47° (Grid).

Magnetic Convergence at surface is: -7.86° (29 June 2013, , BGGM2013)



Noble Energy

Weld County, CO (NAD 83)

Sec. 2-T5N-R64W (Wolfpack 2 South PAD)

Wolfpack B02-62-1HN - A4

Design: Final Surveys

Sperry Drilling Services

Geodetic Report

29 October, 2013

Well Coordinates: 1,399,123.19 N, 3,271,063.74 E (40° 25' 29.68" N, 104° 31' 34.90" W)

Ground Level: 4,615.00 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 Wolfpack B02-62-1HN - Slot A4

KB=16' @ 4631.00usft (Precision 829)

N

Grid

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Wolfpack B02-62-1HN - Final 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° 25' 29.676 N	104° 31' 34.896 W	1,399,123.19	3,271,063.74
310.00	0.00	110.40	310.00	0.00	0.00	40° 25' 29.676 N	104° 31' 34.896 W	1,399,123.19	3,271,063.74
610.00	0.20	216.80	610.00	-0.42	-0.31	40° 25' 29.672 N	104° 31' 34.900 W	1,399,122.77	3,271,063.43
698.00	1.36	62.05	697.99	-0.05	0.52	40° 25' 29.675 N	104° 31' 34.889 W	1,399,123.14	3,271,064.26
787.00	0.83	115.39	786.98	0.17	2.03	40° 25' 29.677 N	104° 31' 34.870 W	1,399,123.36	3,271,065.77
876.00	0.92	122.68	875.97	-0.50	3.22	40° 25' 29.671 N	104° 31' 34.854 W	1,399,122.69	3,271,066.96
966.00	1.73	149.69	965.94	-2.06	4.51	40° 25' 29.655 N	104° 31' 34.838 W	1,399,121.13	3,271,068.25
1,056.00	3.20	169.47	1,055.86	-5.70	5.65	40° 25' 29.619 N	104° 31' 34.824 W	1,399,117.49	3,271,069.39
1,135.00	4.63	170.79	1,134.67	-11.02	6.57	40° 25' 29.566 N	104° 31' 34.813 W	1,399,112.17	3,271,070.31
1,229.00	6.50	175.93	1,228.23	-20.07	7.55	40° 25' 29.477 N	104° 31' 34.801 W	1,399,103.12	3,271,071.29
1,323.00	8.49	182.83	1,321.42	-32.31	7.59	40° 25' 29.356 N	104° 31' 34.802 W	1,399,090.88	3,271,071.33
1,417.00	10.72	187.87	1,414.10	-47.90	6.05	40° 25' 29.202 N	104° 31' 34.825 W	1,399,075.29	3,271,069.79
1,511.00	10.73	183.77	1,506.46	-65.29	4.28	40° 25' 29.030 N	104° 31' 34.850 W	1,399,057.90	3,271,068.02
1,606.00	10.45	181.72	1,599.84	-82.73	3.44	40° 25' 28.858 N	104° 31' 34.863 W	1,399,040.46	3,271,067.18
1,700.00	10.02	190.00	1,692.35	-99.31	1.76	40° 25' 28.695 N	104° 31' 34.887 W	1,399,023.89	3,271,065.50
1,794.00	9.54	187.85	1,784.98	-115.08	-0.72	40° 25' 28.539 N	104° 31' 34.922 W	1,399,008.12	3,271,063.02
1,888.00	10.17	190.43	1,877.60	-130.95	-3.29	40° 25' 28.382 N	104° 31' 34.957 W	1,398,992.24	3,271,060.45
1,983.00	10.32	189.17	1,971.08	-147.60	-6.17	40° 25' 28.218 N	104° 31' 34.997 W	1,398,975.59	3,271,057.58
2,077.00	9.73	186.92	2,063.65	-163.80	-8.46	40° 25' 28.058 N	104° 31' 35.029 W	1,398,959.40	3,271,055.28
2,171.00	9.77	190.62	2,156.29	-179.53	-10.89	40° 25' 27.903 N	104° 31' 35.062 W	1,398,943.67	3,271,052.85
2,279.00	9.11	189.38	2,262.83	-196.97	-13.97	40° 25' 27.731 N	104° 31' 35.105 W	1,398,926.23	3,271,049.77
2,368.00	9.95	191.73	2,350.60	-211.45	-16.68	40° 25' 27.588 N	104° 31' 35.142 W	1,398,911.75	3,271,047.06
2,458.00	9.49	193.49	2,439.31	-226.28	-20.00	40° 25' 27.442 N	104° 31' 35.187 W	1,398,896.92	3,271,043.74
2,547.00	10.06	184.57	2,527.02	-241.16	-22.33	40° 25' 27.295 N	104° 31' 35.219 W	1,398,882.04	3,271,041.41
2,637.00	10.59	184.99	2,615.56	-257.23	-23.67	40° 25' 27.137 N	104° 31' 35.239 W	1,398,865.97	3,271,040.07
2,727.00	11.31	186.94	2,703.92	-274.23	-25.46	40° 25' 26.969 N	104° 31' 35.264 W	1,398,848.97	3,271,038.28
2,816.00	9.48	184.80	2,791.46	-290.20	-27.13	40° 25' 26.811 N	104° 31' 35.288 W	1,398,833.00	3,271,036.61
2,906.00	9.44	185.70	2,880.23	-304.93	-28.48	40° 25' 26.666 N	104° 31' 35.307 W	1,398,818.27	3,271,035.26
2,996.00	8.48	181.76	2,969.13	-318.91	-29.42	40° 25' 26.528 N	104° 31' 35.322 W	1,398,804.29	3,271,034.32
3,086.00	7.46	181.90	3,058.26	-331.38	-29.81	40° 25' 26.405 N	104° 31' 35.328 W	1,398,791.82	3,271,033.93
3,175.00	8.54	186.78	3,146.40	-343.72	-30.79	40° 25' 26.283 N	104° 31' 35.343 W	1,398,779.48	3,271,032.96
3,265.00	10.16	185.21	3,235.20	-358.26	-32.30	40° 25' 26.139 N	104° 31' 35.364 W	1,398,764.94	3,271,031.45
3,354.00	8.77	184.02	3,322.99	-372.85	-33.48	40° 25' 25.995 N	104° 31' 35.382 W	1,398,750.36	3,271,030.26
3,444.00	7.25	182.24	3,412.11	-385.37	-34.19	40° 25' 25.872 N	104° 31' 35.393 W	1,398,737.84	3,271,029.55
3,534.00	8.84	184.52	3,501.22	-397.94	-34.95	40° 25' 25.748 N	104° 31' 35.404 W	1,398,725.27	3,271,028.79
3,624.00	11.19	185.79	3,589.84	-413.52	-36.38	40° 25' 25.594 N	104° 31' 35.425 W	1,398,709.69	3,271,027.36
3,713.00	12.29	186.94	3,676.98	-431.52	-38.40	40° 25' 25.416 N	104° 31' 35.454 W	1,398,691.69	3,271,025.34
3,803.00	11.84	187.66	3,764.99	-450.18	-40.78	40° 25' 25.232 N	104° 31' 35.487 W	1,398,673.03	3,271,022.96
3,893.00	10.03	184.26	3,853.35	-467.14	-42.60	40° 25' 25.065 N	104° 31' 35.513 W	1,398,656.06	3,271,021.14
3,982.00	9.65	185.50	3,941.04	-482.30	-43.89	40° 25' 24.915 N	104° 31' 35.532 W	1,398,640.91	3,271,019.85
4,072.00	9.12	185.29	4,029.84	-496.91	-45.27	40° 25' 24.771 N	104° 31' 35.552 W	1,398,626.30	3,271,018.47
4,162.00	8.50	186.04	4,118.77	-510.63	-46.63	40° 25' 24.636 N	104° 31' 35.571 W	1,398,612.58	3,271,017.12

Design Report for Wolfpack B02-62-1HN - Final Surveys

Measured			Vertical	Local Coordinates		Geographic Coordinates		UTM Coordinates	
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Latitude	Longitude	Northing	Easting
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(usft)
4,251.00	9.62	187.11	4,206.66	-524.55	-48.24	40° 25' 24.498 N	104° 31' 35.594 W	1,398,598.66	3,271,015.50
4,341.00	11.53	183.49	4,295.13	-540.99	-49.72	40° 25' 24.336 N	104° 31' 35.616 W	1,398,582.22	3,271,014.02
4,430.00	11.61	183.96	4,382.32	-558.80	-50.88	40° 25' 24.160 N	104° 31' 35.633 W	1,398,564.41	3,271,012.86
4,520.00	9.45	186.68	4,470.80	-575.18	-52.36	40° 25' 23.998 N	104° 31' 35.655 W	1,398,548.04	3,271,011.38
4,610.00	8.41	186.96	4,559.71	-589.05	-54.02	40° 25' 23.861 N	104° 31' 35.678 W	1,398,534.17	3,271,009.72
4,699.00	9.12	182.11	4,647.67	-602.56	-55.07	40° 25' 23.728 N	104° 31' 35.693 W	1,398,520.66	3,271,008.67
4,789.00	7.93	183.56	4,736.68	-615.88	-55.72	40° 25' 23.596 N	104° 31' 35.704 W	1,398,507.33	3,271,008.03
4,879.00	9.43	187.82	4,825.64	-629.38	-57.10	40° 25' 23.463 N	104° 31' 35.724 W	1,398,493.83	3,271,006.64
4,968.00	11.23	186.21	4,913.20	-645.22	-59.03	40° 25' 23.307 N	104° 31' 35.751 W	1,398,477.99	3,271,004.71
5,058.00	10.49	186.23	5,001.58	-662.08	-60.87	40° 25' 23.141 N	104° 31' 35.777 W	1,398,461.14	3,271,002.87
5,148.00	8.64	186.25	5,090.33	-676.94	-62.50	40° 25' 22.994 N	104° 31' 35.800 W	1,398,446.27	3,271,001.25
5,238.00	8.67	180.94	5,179.31	-690.45	-63.34	40° 25' 22.860 N	104° 31' 35.813 W	1,398,432.77	3,271,000.40
5,327.00	9.26	182.22	5,267.22	-704.31	-63.73	40° 25' 22.724 N	104° 31' 35.820 W	1,398,418.91	3,271,000.01
5,417.00	9.68	185.48	5,355.99	-719.08	-64.73	40° 25' 22.578 N	104° 31' 35.835 W	1,398,404.14	3,270,999.01
5,506.00	10.24	184.75	5,443.65	-734.41	-66.10	40° 25' 22.426 N	104° 31' 35.855 W	1,398,388.81	3,270,997.64
5,596.00	8.73	182.47	5,532.42	-749.21	-67.06	40° 25' 22.280 N	104° 31' 35.869 W	1,398,374.01	3,270,996.68
5,686.00	9.97	187.45	5,621.22	-763.76	-68.37	40° 25' 22.137 N	104° 31' 35.888 W	1,398,359.46	3,270,995.38
5,775.00	10.65	184.81	5,708.79	-779.59	-70.05	40° 25' 21.980 N	104° 31' 35.912 W	1,398,343.63	3,270,993.69
5,865.00	10.66	181.25	5,797.23	-796.20	-70.93	40° 25' 21.816 N	104° 31' 35.926 W	1,398,327.02	3,270,992.81
5,910.00	9.50	181.82	5,841.54	-804.07	-71.14	40° 25' 21.739 N	104° 31' 35.930 W	1,398,319.15	3,270,992.60
5,955.00	9.36	181.03	5,885.93	-811.44	-71.33	40° 25' 21.666 N	104° 31' 35.933 W	1,398,311.78	3,270,992.42
6,000.00	14.47	176.58	5,929.95	-820.72	-71.06	40° 25' 21.574 N	104° 31' 35.931 W	1,398,302.50	3,270,992.69
6,044.00	17.70	178.53	5,972.22	-832.90	-70.56	40° 25' 21.454 N	104° 31' 35.926 W	1,398,290.32	3,270,993.19
6,089.00	21.65	172.99	6,014.59	-847.98	-69.37	40° 25' 21.305 N	104° 31' 35.913 W	1,398,275.24	3,270,994.38
6,134.00	24.52	157.84	6,056.02	-864.89	-64.83	40° 25' 21.137 N	104° 31' 35.857 W	1,398,258.33	3,270,998.92
6,179.00	29.11	145.61	6,096.20	-882.59	-55.11	40° 25' 20.961 N	104° 31' 35.734 W	1,398,240.63	3,271,008.63
6,224.00	32.35	138.26	6,134.89	-900.62	-40.90	40° 25' 20.781 N	104° 31' 35.553 W	1,398,222.60	3,271,022.84
6,269.00	33.54	131.63	6,172.66	-917.87	-23.59	40° 25' 20.609 N	104° 31' 35.331 W	1,398,205.36	3,271,040.15
6,313.00	34.24	125.94	6,209.20	-933.21	-4.48	40° 25' 20.455 N	104° 31' 35.086 W	1,398,190.01	3,271,059.26
6,358.00	35.18	120.04	6,246.20	-947.14	17.00	40° 25' 20.315 N	104° 31' 34.811 W	1,398,176.09	3,271,080.74
6,403.00	35.64	115.28	6,282.88	-959.23	40.08	40° 25' 20.193 N	104° 31' 34.514 W	1,398,164.00	3,271,103.82
6,448.00	36.70	112.23	6,319.21	-969.92	64.39	40° 25' 20.085 N	104° 31' 34.201 W	1,398,153.31	3,271,128.13
6,493.00	40.51	107.54	6,354.38	-979.41	90.79	40° 25' 19.988 N	104° 31' 33.861 W	1,398,143.81	3,271,154.52
6,538.00	45.14	102.74	6,387.38	-987.34	120.30	40° 25' 19.907 N	104° 31' 33.481 W	1,398,135.89	3,271,184.04
6,582.00	47.35	100.29	6,417.81	-993.67	151.44	40° 25' 19.841 N	104° 31' 33.079 W	1,398,129.56	3,271,215.17
6,627.00	49.56	99.55	6,447.66	-999.47	184.62	40° 25' 19.780 N	104° 31' 32.651 W	1,398,123.76	3,271,248.35
6,672.00	51.31	96.59	6,476.32	-1,004.33	218.96	40° 25' 19.728 N	104° 31' 32.208 W	1,398,118.90	3,271,282.69
6,717.00	52.56	95.60	6,504.07	-1,008.09	254.18	40° 25' 19.687 N	104° 31' 31.753 W	1,398,115.14	3,271,317.91
6,762.00	55.74	94.78	6,530.42	-1,011.38	290.50	40° 25' 19.651 N	104° 31' 31.284 W	1,398,111.85	3,271,354.23
6,806.00	59.06	94.40	6,554.12	-1,014.34	327.45	40° 25' 19.618 N	104° 31' 30.806 W	1,398,108.88	3,271,391.17
6,851.00	61.89	94.17	6,576.30	-1,017.27	366.49	40° 25' 19.584 N	104° 31' 30.302 W	1,398,105.96	3,271,430.22
6,896.00	64.74	94.52	6,596.50	-1,020.32	406.58	40° 25' 19.550 N	104° 31' 29.784 W	1,398,102.91	3,271,470.30

Design Report for Wolfpack B02-62-1HN - Final 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)
6,941.00	68.22	94.83	6,614.46	-1,023.68	447.70	40° 25' 19.512 N	104° 31' 29.253 W	1,398,099.55	3,271,511.42
6,986.00	71.10	95.30	6,630.10	-1,027.41	489.72	40° 25' 19.471 N	104° 31' 28.710 W	1,398,095.82	3,271,553.44
7,031.00	73.92	96.34	6,643.62	-1,031.76	532.41	40° 25' 19.423 N	104° 31' 28.159 W	1,398,091.47	3,271,596.13
7,075.00	76.58	97.32	6,654.82	-1,036.82	574.66	40° 25' 19.369 N	104° 31' 27.614 W	1,398,086.41	3,271,638.37
7,094.00	78.93	97.79	6,658.85	-1,039.26	593.06	40° 25' 19.343 N	104° 31' 27.376 W	1,398,083.97	3,271,656.78
7,136.00	81.02	96.34	6,666.16	-1,044.35	634.10	40° 25' 19.288 N	104° 31' 26.846 W	1,398,078.88	3,271,697.82
7,163.00	82.36	95.41	6,670.07	-1,047.08	660.68	40° 25' 19.258 N	104° 31' 26.503 W	1,398,076.15	3,271,724.39
7,208.00	83.91	97.25	6,675.45	-1,052.01	705.08	40° 25' 19.204 N	104° 31' 25.929 W	1,398,071.22	3,271,768.79
7,298.00	89.11	98.29	6,680.92	-1,064.15	794.06	40° 25' 19.075 N	104° 31' 24.781 W	1,398,059.08	3,271,857.77
7,388.00	89.85	96.62	6,681.74	-1,075.83	883.29	40° 25' 18.950 N	104° 31' 23.629 W	1,398,047.40	3,271,946.99
7,477.00	91.48	95.39	6,680.71	-1,085.14	971.79	40° 25' 18.848 N	104° 31' 22.486 W	1,398,038.10	3,272,035.49
7,567.00	91.97	93.16	6,678.00	-1,091.84	1,061.49	40° 25' 18.772 N	104° 31' 21.327 W	1,398,031.39	3,272,125.19
7,657.00	91.60	89.16	6,675.19	-1,093.66	1,151.41	40° 25' 18.744 N	104° 31' 20.165 W	1,398,029.57	3,272,215.11
7,746.00	90.49	85.48	6,673.57	-1,089.50	1,240.28	40° 25' 18.776 N	104° 31' 19.015 W	1,398,033.73	3,272,303.97
7,836.00	90.77	85.15	6,672.58	-1,082.15	1,329.98	40° 25' 18.839 N	104° 31' 17.855 W	1,398,041.08	3,272,393.66
7,925.00	90.00	86.30	6,671.98	-1,075.52	1,418.72	40° 25' 18.894 N	104° 31' 16.706 W	1,398,047.71	3,272,482.41
8,015.00	90.77	86.69	6,671.38	-1,070.02	1,508.55	40° 25' 18.939 N	104° 31' 15.544 W	1,398,053.22	3,272,572.23
8,105.00	89.42	87.00	6,671.23	-1,065.06	1,598.41	40° 25' 18.978 N	104° 31' 14.382 W	1,398,058.17	3,272,662.09
8,194.00	90.28	87.26	6,671.46	-1,060.61	1,687.30	40° 25' 19.012 N	104° 31' 13.232 W	1,398,062.62	3,272,750.98
8,284.00	87.41	87.86	6,673.28	-1,056.78	1,777.19	40° 25' 19.040 N	104° 31' 12.069 W	1,398,066.46	3,272,840.86
8,373.00	89.78	88.81	6,675.46	-1,054.19	1,866.12	40° 25' 19.056 N	104° 31' 10.919 W	1,398,069.04	3,272,929.79
8,463.00	90.89	90.13	6,674.93	-1,053.36	1,956.11	40° 25' 19.055 N	104° 31' 9.755 W	1,398,069.87	3,273,019.78
8,553.00	89.01	89.18	6,675.01	-1,052.82	2,046.10	40° 25' 19.050 N	104° 31' 8.592 W	1,398,070.41	3,273,109.77
8,642.00	89.14	90.29	6,676.45	-1,052.40	2,135.09	40° 25' 19.045 N	104° 31' 7.441 W	1,398,070.83	3,273,198.75
8,732.00	90.03	88.78	6,677.10	-1,051.67	2,225.08	40° 25' 19.042 N	104° 31' 6.278 W	1,398,071.56	3,273,288.74
8,822.00	92.19	87.29	6,675.36	-1,048.59	2,315.00	40° 25' 19.063 N	104° 31' 5.115 W	1,398,074.64	3,273,378.65
8,911.00	91.88	87.77	6,672.20	-1,044.76	2,403.87	40° 25' 19.091 N	104° 31' 3.965 W	1,398,078.47	3,273,467.51
9,001.00	92.56	89.78	6,668.71	-1,042.83	2,493.77	40° 25' 19.100 N	104° 31' 2.802 W	1,398,080.40	3,273,557.42
9,090.00	90.55	89.96	6,666.29	-1,042.63	2,582.73	40° 25' 19.092 N	104° 31' 1.652 W	1,398,080.60	3,273,646.37
9,180.00	90.83	87.63	6,665.21	-1,040.74	2,672.70	40° 25' 19.101 N	104° 31' 0.489 W	1,398,082.49	3,273,736.34
9,270.00	89.72	89.06	6,664.78	-1,038.14	2,762.66	40° 25' 19.117 N	104° 30' 59.325 W	1,398,085.09	3,273,826.29
9,360.00	90.28	89.29	6,664.78	-1,036.84	2,852.65	40° 25' 19.120 N	104° 30' 58.162 W	1,398,086.39	3,273,916.28
9,449.00	89.08	89.37	6,665.27	-1,035.80	2,941.64	40° 25' 19.120 N	104° 30' 57.011 W	1,398,087.43	3,274,005.27
9,539.00	88.77	87.69	6,666.96	-1,033.50	3,031.59	40° 25' 19.133 N	104° 30' 55.848 W	1,398,089.73	3,274,095.21
9,628.00	89.14	88.06	6,668.59	-1,030.20	3,120.52	40° 25' 19.156 N	104° 30' 54.698 W	1,398,093.03	3,274,184.13
9,718.00	88.95	86.73	6,670.09	-1,026.11	3,210.41	40° 25' 19.187 N	104° 30' 53.535 W	1,398,097.12	3,274,274.02
9,807.00	89.35	86.94	6,671.41	-1,021.19	3,299.26	40° 25' 19.225 N	104° 30' 52.385 W	1,398,102.04	3,274,362.87
9,897.00	90.09	86.50	6,671.85	-1,016.04	3,389.11	40° 25' 19.266 N	104° 30' 51.223 W	1,398,107.19	3,274,452.72
9,987.00	91.94	87.08	6,670.25	-1,011.01	3,478.95	40° 25' 19.306 N	104° 30' 50.061 W	1,398,112.22	3,274,542.56
10,076.00	93.17	86.68	6,666.28	-1,006.17	3,567.73	40° 25' 19.344 N	104° 30' 48.912 W	1,398,117.06	3,274,631.33
10,160.00	93.18	88.82	6,661.63	-1,002.87	3,651.53	40° 25' 19.368 N	104° 30' 47.828 W	1,398,120.36	3,274,715.13
10,254.00	93.06	88.89	6,656.52	-1,001.00	3,745.37	40° 25' 19.376 N	104° 30' 46.615 W	1,398,122.23	3,274,808.97

Design Report for Wolfpack B02-62-1HN - Final 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)
10,344.00	91.42	89.62	6,653.00	-999.83	3,835.29	40° 25' 19.378 N	104° 30' 45.452 W	1,398,123.40	3,274,898.89
10,434.00	89.78	89.05	6,652.06	-998.78	3,925.28	40° 25' 19.378 N	104° 30' 44.288 W	1,398,124.44	3,274,988.87
10,523.00	90.65	88.68	6,651.72	-997.02	4,014.26	40° 25' 19.386 N	104° 30' 43.138 W	1,398,126.21	3,275,077.85
10,613.00	90.15	88.17	6,651.09	-994.55	4,104.22	40° 25' 19.400 N	104° 30' 41.974 W	1,398,128.68	3,275,167.81
10,703.00	90.37	87.87	6,650.68	-991.44	4,194.17	40° 25' 19.421 N	104° 30' 40.811 W	1,398,131.79	3,275,257.75
10,792.00	91.73	88.31	6,649.05	-988.47	4,283.10	40° 25' 19.440 N	104° 30' 39.661 W	1,398,134.76	3,275,346.68
10,886.00	89.75	87.50	6,647.84	-985.04	4,377.03	40° 25' 19.464 N	104° 30' 38.446 W	1,398,138.19	3,275,440.60
10,951.00	89.75	87.50	6,648.12	-982.20	4,441.96	40° 25' 19.485 N	104° 30' 37.606 W	1,398,141.03	3,275,505.53

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
610.00	610.00	-0.42	-0.31	Tie-On to Surface Gyros @ 610.00ft
698.00	697.99	-0.05	0.52	First MWD Survey @ 698.00ft
10,886.00	6,647.84	-985.04	4,377.03	Final MWD Survey @ 10886.00ft
10,951.00	6,648.12	-982.20	4,441.96	Straight Line Proj @ 10951' MD, 6648.12' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Wolfpack B02-62-1HN_Rev A0_BHL Tgt	102.59	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
310.00	610.00	Surface Gyros	Flexi-Shot
698.00	7,094.00	MWD Surveys - Vert/Build	MWD
7,163.00	10,886.00	MWD Surveys - Lateral	MWD

Design Report for Wolfpack B02-62-1HN - Final Surveys

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
7,136.00	6,666.16	Estimated: 7" Casing @ 7136' MD, 6666.16' TVD	7	8-3/4

Design Targets

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

Average Dogleg over Survey:	2.16 °/100usft	Maximum Dogleg over Survey:	15.90 °/100usft at 6,179.00 usft
Net Tortousity applicable to Plans:	1.00 °/100usft	Directional Difficulty Index:	6.324

Audit Info

North Reference Sheet for Sec. 2-T5N-R64W (Wolfpack 2 South PAD) - Wolfpack B02-62-1HN

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to KB=16' @ 4631.00usft (Precision 829). Northing and Easting are relative to Wolfpack B02-62-1HN - Slot A4

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° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996145

Grid Coordinates of Well: 1,399,123.19 usft N, 3,271,063.74 usft E

Geographical Coordinates of Well: 40° 25' 29.68" N, 104° 31' 34.90" W

Grid Convergence at Surface is: 0.63°

Based upon Minimum Curvature type calculations, at a Measured Depth of 10,951.00usft

the Bottom Hole Displacement is 4,549.26usft in the Direction of 102.47° (Grid).

Magnetic Convergence at surface is: -7.86° (29 June 2013, BGGM2013)

