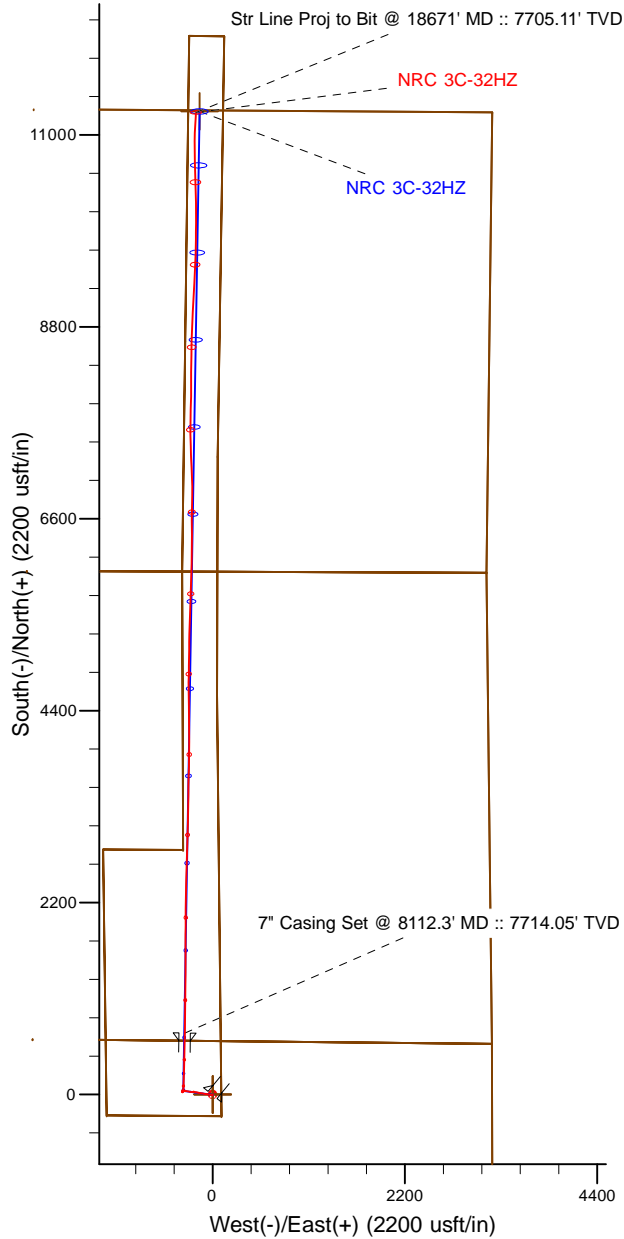
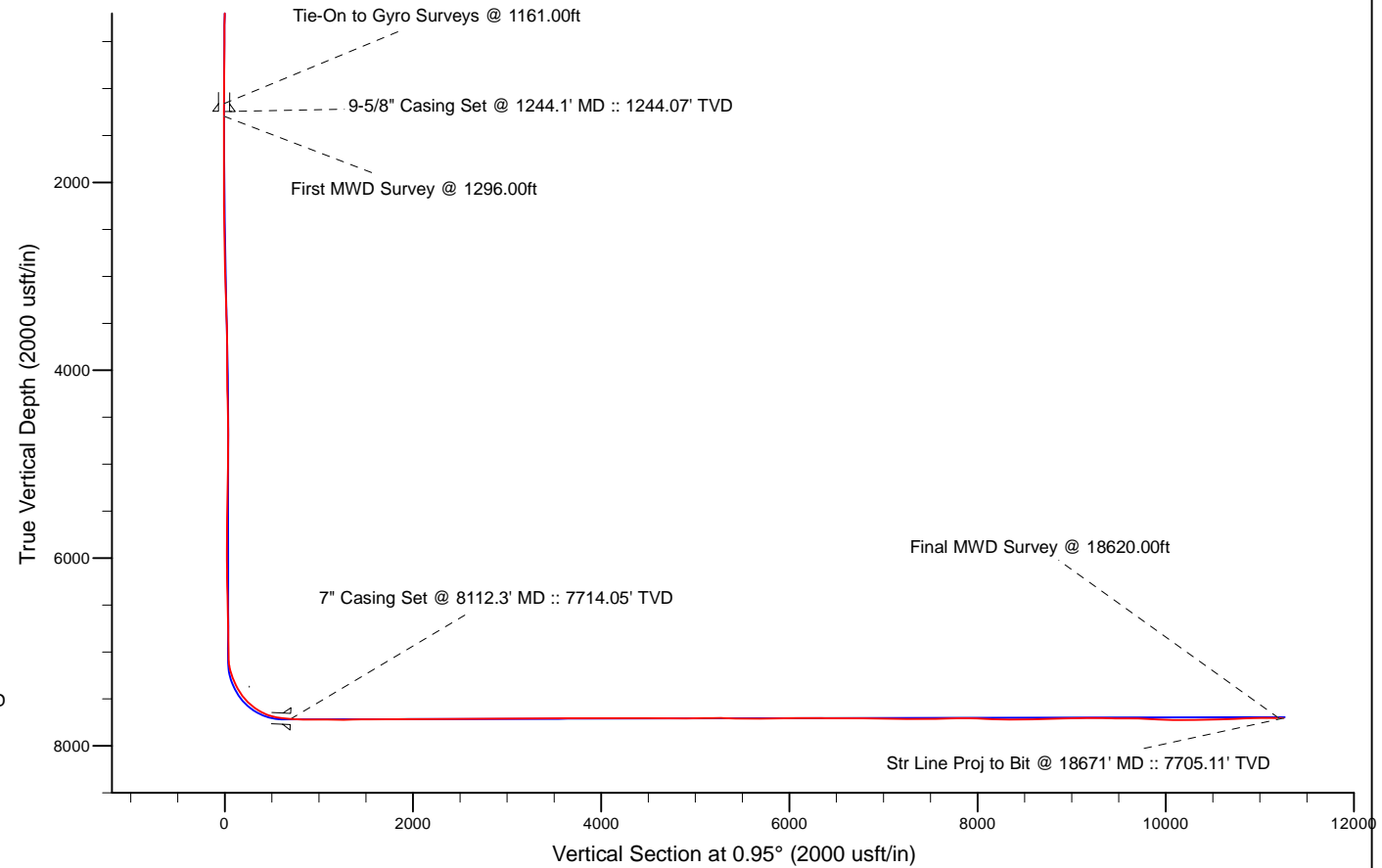


Project: Weld County, CO (NAD 83)
 Site: Sec. 8-T1N-R67W
 Well: NRC 3C-32HZ
 Wellbore: Plan A
 Design: Actual Surveys



LEGEND

- ▲ NRC 3C-32HZ, Plan A, Rev A1 V0
- Actual Surveys



7" Casing: ~88.59' FSL, ~1744.02' FWL
 Lat/Long: 40.073100 N, -104.917675 E
 State Planes - CO Northern: 1,270,010.31' N, 3,162,964.59' E
 Location: Sec. 5-T1N-R67W

BHL: ~13.86' FNL, ~1858.38' FWL
 Lat/Long: 40.102069 N, -104.917219 E
 State Planes - CO Northern: 1,280,563.63' N, 3,163,022.72' E
 Location: Sec. 32-T2N-R67W

WELL DETAILS: NRC 3C-32HZ	
Ground Level: 5034.00	
RKB = 25' @ 5059.00usft (H&P 308)	
Design: Actual Surveys (NRC 3C-32HZ/Plan A)	
Created By: Clint Eshelman	Date: 6/16/2014
Reviewed: _____	Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T1N-R67W

NRC 3C-32HZ

Plan A

Design: Actual Surveys

Sperry Drilling Services

Standard Report

16 June, 2014

Well Coordinates: 1,269,308.40 N, 3,163,289.46 E (40° 04' 16.20" N, 104° 54' 59.51" W)

Ground Level: 5,034.00 usft

Local Coordinate Origin:

Centered on Well NRC 3C-32HZ

Viewing Datum:

RKB = 25' @ 5059.00usft (H&P 308)

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 NRC 3C-32HZ - Actual 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
25.00	0.00	0.00	25.00	0.00	0.00	0.00	0.00
125.00	0.48	200.36	125.00	-0.39	-0.15	-0.40	0.48
225.00	0.52	185.47	225.00	-1.24	-0.33	-1.24	0.14
325.00	0.49	188.51	324.99	-2.11	-0.44	-2.12	0.04
425.00	0.51	181.42	424.99	-2.98	-0.52	-2.99	0.06
525.00	0.54	158.84	524.98	-3.86	-0.36	-3.87	0.21
625.00	0.49	170.38	624.98	-4.72	-0.11	-4.73	0.11
725.00	0.39	178.84	724.98	-5.49	-0.04	-5.49	0.12
825.00	0.25	181.44	824.97	-6.05	-0.04	-6.04	0.14
925.00	0.10	186.58	924.97	-6.35	-0.05	-6.35	0.15
1,025.00	0.10	198.42	1,024.97	-6.52	-0.09	-6.52	0.02
1,125.00	0.16	316.73	1,124.97	-6.50	-0.21	-6.50	0.23
1,161.00	0.10	307.63	1,160.97	-6.44	-0.27	-6.45	0.18
Tie-On to Gyro Surveys @ 1161.00ft							
1,244.10	0.36	219.27	1,244.07	-6.60	-0.49	-6.61	0.45
9-5/8" Casing Set @ 1244.1' MD :: 1244.07' TVD							
1,296.00	0.59	213.20	1,295.97	-6.95	-0.74	-6.97	0.45
First MWD Survey @ 1296.00ft							
1,389.00	0.67	184.78	1,388.97	-7.90	-1.05	-7.91	0.34
1,481.00	0.62	213.29	1,480.96	-8.85	-1.37	-8.87	0.35
1,573.00	0.48	183.51	1,572.96	-9.65	-1.67	-9.68	0.34
1,759.00	0.48	245.39	1,758.95	-10.75	-2.42	-10.79	0.27
1,851.00	0.63	218.58	1,850.95	-11.31	-3.09	-11.36	0.32
1,942.00	1.88	289.62	1,941.93	-11.20	-4.81	-11.28	1.95
2,035.00	1.68	281.94	2,034.88	-10.40	-7.58	-10.53	0.33
2,128.00	1.79	291.33	2,127.84	-9.59	-10.26	-9.76	0.33
2,220.00	1.52	292.11	2,219.80	-8.61	-12.73	-8.82	0.29
2,311.00	1.28	292.26	2,310.77	-7.77	-14.79	-8.02	0.26
2,403.00	2.98	289.66	2,402.71	-6.58	-18.00	-6.88	1.85
2,495.00	4.03	286.34	2,494.53	-4.86	-23.35	-5.25	1.16
2,588.00	5.95	284.14	2,587.18	-2.77	-31.16	-3.28	2.07
2,680.00	7.78	281.06	2,678.51	-0.41	-41.90	-1.10	2.03
2,774.00	8.91	278.28	2,771.52	1.86	-55.35	0.94	1.28
2,867.00	9.26	275.73	2,863.35	3.65	-69.92	2.49	0.57
2,960.00	11.20	280.36	2,954.87	6.02	-86.25	4.59	2.26
3,052.00	9.43	279.47	3,045.38	8.86	-102.47	7.16	1.93
3,143.00	10.89	281.98	3,134.95	11.88	-118.24	9.91	1.68
3,235.00	9.00	279.93	3,225.56	14.92	-133.83	12.70	2.09
3,327.00	11.01	280.69	3,316.16	17.79	-149.55	15.31	2.19
3,419.00	9.25	278.90	3,406.72	20.57	-165.49	17.82	1.94
3,511.00	11.16	283.06	3,497.26	23.72	-181.47	20.71	2.22
3,602.00	9.28	280.50	3,586.82	27.05	-197.26	23.77	2.12
3,694.00	5.64	277.70	3,678.02	29.01	-209.04	25.54	3.98
3,786.00	4.99	278.25	3,769.63	30.19	-217.48	26.58	0.71
3,889.00	4.93	259.42	3,872.25	30.02	-226.27	26.26	1.57
3,981.00	6.23	263.58	3,963.81	28.73	-235.11	24.83	1.48
4,073.00	8.32	274.67	4,055.07	28.72	-246.71	24.62	2.73
4,165.00	8.18	283.63	4,146.12	30.80	-259.70	26.49	1.40
4,257.00	7.24	281.12	4,237.29	33.46	-271.75	28.95	1.09

Design Report for NRC 3C-32HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,348.00	6.83	281.93	4,327.60	35.69	-282.67	30.99	0.46
4,443.00	6.27	280.52	4,421.98	37.80	-293.30	32.93	0.61
4,537.00	5.68	279.54	4,515.47	39.51	-302.94	34.48	0.64
4,632.00	4.21	269.61	4,610.12	40.26	-311.06	35.10	1.79
4,726.00	3.57	272.38	4,703.90	40.36	-317.43	35.09	0.71
4,821.00	3.87	275.28	4,798.70	40.78	-323.58	35.41	0.37
4,915.00	3.71	277.75	4,892.50	41.48	-329.75	36.01	0.24
5,009.00	2.16	247.23	4,986.37	41.21	-334.40	35.66	2.29
5,104.00	1.95	245.01	5,081.31	39.83	-337.52	34.23	0.24
5,198.00	1.98	256.75	5,175.26	38.78	-340.55	33.13	0.43
5,293.00	1.73	195.12	5,270.22	37.02	-342.52	31.34	2.01
5,387.00	1.44	217.35	5,364.18	34.71	-343.61	29.01	0.72
5,482.00	1.05	215.06	5,459.16	33.05	-344.83	27.33	0.41
5,576.00	1.03	214.15	5,553.14	31.65	-345.80	25.91	0.03
5,670.00	0.79	203.93	5,647.13	30.36	-346.54	24.61	0.31
5,765.00	1.09	203.92	5,742.12	28.93	-347.17	23.17	0.32
5,859.00	0.85	297.50	5,836.11	28.44	-348.15	22.66	1.51
5,953.00	0.64	304.29	5,930.10	29.05	-349.20	23.26	0.24
6,048.00	0.61	312.02	6,025.10	29.69	-350.02	23.88	0.09
6,142.00	0.66	313.45	6,119.09	30.40	-350.78	24.58	0.06
6,236.00	1.44	54.82	6,213.08	31.45	-350.21	25.64	1.81
6,330.00	1.31	34.82	6,307.05	33.02	-348.63	27.23	0.53
6,425.00	1.23	38.82	6,402.03	34.70	-347.37	28.94	0.13
6,519.00	1.73	33.64	6,496.00	36.67	-345.95	30.93	0.55
6,614.00	1.65	30.04	6,590.96	39.05	-344.47	33.33	0.14
6,708.00	1.38	29.43	6,684.92	41.20	-343.24	35.51	0.29
6,803.00	1.09	40.84	6,779.90	42.88	-342.09	37.21	0.40
6,898.00	0.82	46.15	6,874.89	44.04	-341.00	38.38	0.30
6,992.00	1.23	46.34	6,968.87	45.20	-339.79	39.56	0.44
7,085.00	1.40	52.81	7,061.85	46.58	-338.16	40.96	0.24
7,134.00	4.97	7.43	7,110.77	49.04	-337.41	43.44	8.39
7,181.00	10.05	3.71	7,157.35	55.16	-336.88	49.57	10.85
7,228.00	15.65	2.30	7,203.16	65.59	-336.36	60.01	11.93
7,276.00	19.77	2.08	7,248.87	80.18	-335.81	74.60	8.58
7,323.00	21.83	1.02	7,292.81	96.86	-335.36	91.29	4.46
7,371.00	25.08	357.59	7,336.84	115.96	-335.63	110.38	7.34
7,418.00	28.33	1.39	7,378.82	137.07	-335.78	131.48	7.81
7,465.00	31.05	4.44	7,419.65	160.31	-334.57	154.74	6.62
7,512.00	34.87	5.40	7,459.08	185.77	-332.37	180.24	8.20
7,560.00	40.39	3.32	7,497.08	214.98	-330.17	209.48	11.80
7,607.00	45.88	1.42	7,531.37	247.08	-328.87	241.59	12.00
7,654.00	49.87	1.37	7,562.88	281.92	-328.02	276.44	8.49
7,701.00	53.20	1.60	7,592.12	318.70	-327.07	313.24	7.10
7,749.00	57.02	1.67	7,619.57	358.05	-325.95	352.60	7.96
7,796.00	62.37	1.83	7,643.27	398.59	-324.71	393.16	11.39
7,844.00	67.22	1.20	7,663.71	442.00	-323.56	436.57	10.17
7,891.00	72.86	1.02	7,679.75	486.15	-322.71	480.73	12.01
7,938.00	77.21	0.18	7,691.88	531.54	-322.24	526.12	9.41
7,985.00	79.84	0.45	7,701.23	577.59	-321.98	572.18	5.62
8,032.00	82.55	1.10	7,708.43	624.03	-321.35	618.62	5.93
8,074.00	86.30	0.60	7,712.50	665.82	-320.73	660.41	9.01

Design Report for NRC 3C-32HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,112.30	87.30	0.84	7,714.64	704.06	-320.25	698.65	2.68
7" Casing Set @ 8112.3' MD :: 7714.05' TVD							
8,206.00	89.75	1.41	7,717.05	797.70	-318.42	792.31	2.68
8,301.00	88.86	1.03	7,718.21	892.67	-316.40	887.30	1.02
8,395.00	88.61	0.46	7,720.28	986.64	-315.17	981.28	0.66
8,490.00	89.26	0.41	7,722.05	1,081.62	-314.45	1,076.26	0.69
8,584.00	89.88	0.61	7,722.75	1,175.61	-313.62	1,170.25	0.69
8,679.00	90.65	0.47	7,722.31	1,270.61	-312.72	1,265.25	0.82
8,773.00	90.80	0.27	7,721.12	1,364.60	-312.11	1,359.24	0.27
8,868.00	91.14	0.01	7,719.51	1,459.58	-311.88	1,454.21	0.45
8,963.00	90.28	0.06	7,718.34	1,554.58	-311.82	1,549.19	0.91
9,057.00	90.28	359.90	7,717.88	1,648.58	-311.86	1,643.18	0.17
9,152.00	89.82	0.23	7,717.80	1,743.57	-311.75	1,738.17	0.60
9,247.00	90.89	0.81	7,717.21	1,838.57	-310.89	1,833.16	1.28
9,342.00	91.14	0.34	7,715.52	1,933.55	-309.93	1,928.14	0.56
9,437.00	89.20	0.35	7,715.24	2,028.54	-309.36	2,023.13	2.04
9,532.00	89.78	1.46	7,716.09	2,123.52	-307.86	2,118.13	1.32
9,627.00	90.22	1.04	7,716.09	2,218.50	-305.79	2,213.12	0.64
9,722.00	90.68	0.45	7,715.34	2,313.49	-304.55	2,308.12	0.79
9,816.00	90.71	1.60	7,714.20	2,407.46	-302.87	2,402.11	1.22
9,911.00	90.12	0.16	7,713.51	2,502.45	-301.41	2,497.11	1.64
10,006.00	89.82	1.40	7,713.56	2,597.44	-300.12	2,592.10	1.34
10,100.00	90.25	0.63	7,713.51	2,691.42	-298.46	2,686.10	0.94
10,195.00	90.83	2.69	7,712.61	2,786.37	-295.70	2,781.09	2.25
10,289.00	91.45	2.28	7,710.74	2,880.26	-291.63	2,875.03	0.79
10,384.00	90.92	2.16	7,708.78	2,975.17	-287.95	2,969.99	0.57
10,478.00	89.08	1.39	7,708.78	3,069.12	-285.04	3,063.97	2.12
10,566.00	89.85	1.20	7,709.60	3,157.10	-283.05	3,151.97	0.90
10,659.00	90.22	0.92	7,709.54	3,250.08	-281.33	3,244.97	0.50
10,751.00	90.65	0.87	7,708.84	3,342.07	-279.89	3,336.97	0.47
10,844.00	91.11	0.49	7,707.41	3,435.05	-278.79	3,429.95	0.64
10,935.00	90.25	1.41	7,706.33	3,526.03	-277.28	3,520.94	1.38
11,028.00	90.99	1.47	7,705.33	3,618.99	-274.94	3,613.94	0.80
11,121.00	89.91	1.98	7,704.60	3,711.94	-272.14	3,706.92	1.28
11,214.00	89.94	1.20	7,704.72	3,804.91	-269.56	3,799.92	0.84
11,306.00	89.14	359.54	7,705.46	3,896.90	-268.97	3,891.90	2.00
11,397.00	89.63	359.61	7,706.43	3,987.89	-269.64	3,982.87	0.54
11,490.00	90.00	359.20	7,706.73	4,080.89	-270.61	4,075.84	0.59
11,583.00	90.15	359.62	7,706.61	4,173.88	-271.57	4,168.80	0.48
11,675.00	89.69	359.50	7,706.74	4,265.88	-272.27	4,260.78	0.52
11,766.00	89.91	358.58	7,707.06	4,356.86	-273.80	4,351.72	1.04
11,858.00	90.46	0.24	7,706.76	4,448.85	-274.75	4,443.69	1.90
11,950.00	91.11	0.28	7,705.50	4,540.84	-274.33	4,535.67	0.71
12,043.00	88.86	359.59	7,705.53	4,633.84	-274.43	4,628.65	2.53
12,135.00	88.58	359.64	7,707.58	4,725.81	-275.05	4,720.60	0.31
12,229.00	89.41	0.72	7,709.23	4,819.79	-274.76	4,814.58	1.45
12,322.00	90.46	1.04	7,709.33	4,912.78	-273.33	4,907.58	1.18
12,415.00	91.23	1.06	7,707.96	5,005.76	-271.62	5,000.56	0.83
12,506.00	91.73	0.95	7,705.61	5,096.71	-270.03	5,091.53	0.56
12,598.00	90.25	0.71	7,704.02	5,188.68	-268.70	5,183.52	1.63
12,690.00	89.91	0.83	7,703.89	5,280.68	-267.46	5,275.52	0.39

Design Report for NRC 3C-32HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
12,782.00	87.07	2.17	7,706.32	5,372.60	-265.05	5,367.47	3.41
12,873.00	88.67	2.50	7,709.70	5,463.46	-261.35	5,458.38	1.80
12,965.00	88.95	2.16	7,711.61	5,555.36	-257.61	5,550.33	0.48
13,057.00	90.03	1.88	7,712.43	5,647.30	-254.37	5,642.31	1.21
13,149.00	90.71	1.51	7,711.84	5,739.26	-251.65	5,734.30	0.84
13,241.00	91.60	1.52	7,709.98	5,831.21	-249.21	5,826.27	0.97
13,333.00	91.42	2.21	7,707.56	5,923.13	-246.22	5,918.23	0.77
13,426.00	90.46	2.43	7,706.03	6,016.04	-242.46	6,011.19	1.06
13,521.00	90.06	1.06	7,705.60	6,110.99	-239.56	6,106.18	1.50
13,615.00	89.66	359.85	7,705.83	6,204.98	-238.82	6,200.17	1.36
13,710.00	90.34	359.35	7,705.83	6,299.98	-239.48	6,295.14	0.89
13,804.00	89.29	359.32	7,706.13	6,393.97	-240.57	6,389.10	1.12
13,898.00	89.35	359.71	7,707.25	6,487.96	-241.37	6,483.07	0.42
13,993.00	89.10	0.63	7,708.53	6,582.95	-241.08	6,578.05	1.00
14,087.00	89.44	1.96	7,709.73	6,676.92	-238.96	6,672.04	1.46
14,181.00	90.09	1.47	7,710.12	6,770.87	-236.15	6,766.03	0.87
14,276.00	90.71	0.94	7,709.45	6,865.85	-234.15	6,861.02	0.86
14,370.00	88.92	358.79	7,709.76	6,959.84	-234.37	6,955.00	2.98
14,465.00	89.54	358.42	7,711.03	7,054.80	-236.68	7,049.91	0.76
14,559.00	88.92	357.57	7,712.30	7,148.73	-239.97	7,143.77	1.12
14,653.00	88.64	356.90	7,714.30	7,242.60	-244.51	7,237.55	0.77
14,748.00	89.97	358.02	7,715.45	7,337.50	-248.71	7,332.37	1.83
14,842.00	90.52	358.97	7,715.05	7,431.46	-251.18	7,426.28	1.17
14,937.00	91.60	359.06	7,713.29	7,526.43	-252.82	7,521.21	1.14
15,031.00	90.55	359.35	7,711.53	7,620.41	-254.12	7,615.15	1.16
15,126.00	91.76	359.98	7,709.61	7,715.38	-254.68	7,710.10	1.44
15,220.00	91.05	2.14	7,707.31	7,809.33	-252.94	7,804.07	2.42
15,315.00	89.08	2.11	7,707.20	7,904.26	-249.41	7,899.04	2.07
15,409.00	88.12	0.17	7,709.50	7,998.21	-247.55	7,993.01	2.30
15,504.00	88.49	0.15	7,712.31	8,093.17	-247.28	8,087.96	0.39
15,598.00	87.41	0.07	7,715.67	8,187.11	-247.10	8,181.88	1.15
15,693.00	88.15	0.02	7,719.35	8,282.03	-247.03	8,276.80	0.78
15,787.00	89.69	1.14	7,721.12	8,376.01	-246.07	8,370.78	2.03
15,882.00	91.05	2.45	7,720.51	8,470.96	-243.10	8,465.76	1.99
15,977.00	89.91	1.11	7,719.71	8,565.90	-240.15	8,560.74	1.85
16,072.00	92.13	0.48	7,718.02	8,660.87	-238.83	8,655.72	2.43
16,167.00	91.42	1.17	7,715.08	8,755.82	-237.46	8,750.67	1.04
16,261.00	92.72	1.52	7,711.68	8,849.73	-235.26	8,844.61	1.43
16,356.00	91.51	3.04	7,708.18	8,944.58	-231.48	8,939.51	2.04
16,451.00	91.35	3.59	7,705.81	9,039.39	-225.99	9,034.40	0.60
16,546.00	91.29	5.21	7,703.62	9,134.08	-218.70	9,129.20	1.71
16,641.00	89.20	3.53	7,703.21	9,228.80	-211.46	9,224.02	2.82
16,735.00	88.52	2.28	7,705.08	9,322.66	-206.70	9,317.95	1.51
16,830.00	88.30	1.80	7,707.72	9,417.56	-203.32	9,412.89	0.56
16,925.00	89.72	1.38	7,709.36	9,512.51	-200.69	9,507.87	1.56
17,020.00	89.63	2.00	7,709.90	9,607.46	-197.88	9,602.86	0.66
17,114.00	89.26	1.36	7,710.81	9,701.42	-195.13	9,696.85	0.79
17,209.00	87.69	1.36	7,713.34	9,796.35	-192.87	9,791.81	1.65
17,303.00	86.94	0.34	7,717.74	9,890.24	-191.48	9,885.70	1.35
17,398.00	87.60	0.00	7,722.27	9,985.13	-191.20	9,980.59	0.78
17,492.00	89.04	359.62	7,725.02	10,079.09	-191.51	10,074.53	1.58

Design Report for NRC 3C-32HZ - Actual Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
17,587.00	90.62	0.01	7,725.30	10,174.08	-191.82	10,169.50	1.71
17,682.00	89.88	359.35	7,724.89	10,269.08	-192.35	10,264.48	1.04
17,776.00	91.48	358.56	7,723.77	10,363.05	-194.06	10,358.41	1.90
17,871.00	90.83	357.47	7,721.86	10,457.97	-197.35	10,453.26	1.34
17,965.00	91.29	358.64	7,720.12	10,551.90	-200.54	10,547.13	1.34
18,059.00	92.07	357.90	7,717.36	10,645.82	-203.38	10,640.98	1.14
18,154.00	92.56	359.07	7,713.53	10,740.71	-205.89	10,735.82	1.33
18,248.00	92.71	359.62	7,709.20	10,834.60	-206.96	10,829.68	0.61
18,343.00	91.73	0.47	7,705.52	10,929.53	-206.89	10,924.59	1.37
18,437.00	90.40	2.55	7,703.78	11,023.47	-204.41	11,018.57	2.63
18,532.00	89.63	3.16	7,703.75	11,118.35	-199.68	11,113.51	1.03
18,620.00	89.35	2.76	7,704.54	11,206.23	-195.13	11,201.45	0.55
Final MWD Survey @ 18620.00ft							
18,671.00	89.35	2.76	7,705.11	11,257.17	-192.68	11,252.43	0.00
Str Line Proj to Bit @ 18671' MD :: 7705.11' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
1,161.00	1,160.97	-6.44	-0.27	Tie-On to Gyro Surveys @ 1161.00ft
1,296.00	1,295.97	-6.95	-0.74	First MWD Survey @ 1296.00ft
18,620.00	7,704.54	11,206.23	-195.13	Final MWD Survey @ 18620.00ft
18,671.00	7,705.11	11,257.17	-192.68	Str Line Proj to Bit @ 18671' MD :: 7705.11' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	+E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.95	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
25.00	1,161.00	Surface Gyro Surveys	NS-GYRO-MS
1,296.00	8,206.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
8,301.00	18,620.00	MWD Lateral Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,244.10	1,244.07	9-5/8" Casing Set @ 1244.1' MD :: 1244.07' TVD	9-5/8	13-1/2
8,112.30	7,714.64	7" Casing Set @ 8112.3' MD :: 7714.05' TVD	7	8-3/4

Design Report for NRC 3C-32HZ - Actual 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
NRC 3C-32HZ_LD - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,269,308.41	3,163,289.46	40.071167	-104.916530
Point 1				0.00	12,134.57	-268.61	1,281,440.48	3,162,941.02	
Point 2				0.00	12,129.74	130.40	1,281,438.28	3,163,340.04	
Point 3				0.00	7,314.60	56.78	1,276,622.94	3,163,298.11	
Point 4				0.00	4,580.69	50.42	1,273,889.16	3,163,309.74	
Point 5				0.00	-249.37	99.86	1,269,059.71	3,163,390.95	
Point 6				0.00	-239.43	-1,212.98	1,269,061.01	3,162,078.13	
Point 7				0.00	2,809.89	-1,254.84	1,272,109.87	3,162,016.21	
Point 8				0.00	2,801.93	-340.77	1,272,107.93	3,162,930.27	
Point 9				0.00	5,992.73	-349.63	1,275,298.48	3,162,900.42	
Point 10				0.00	8,639.18	-315.01	1,277,945.00	3,162,917.63	
NRC 3C-32HZ_SEC - actual wellpath hits target center - Polygon	0.00	0.00	0.00	0.00	0.00	1,269,308.41	3,163,289.46	40.071167	-104.916530
Point 1				0.00	11,293.42	-2,050.80	1,280,587.66	3,161,164.48	
Point 2				0.00	11,260.35	3,198.39	1,280,589.13	3,166,413.57	
Point 3				0.00	5,979.69	3,131.48	1,275,308.34	3,166,381.41	
Point 4				0.00	6,000.34	-2,130.33	1,275,294.37	3,161,119.78	
Point 5				0.00	5,979.69	3,131.48	1,275,308.34	3,166,381.41	
Point 6				0.00	5,979.69	3,131.48	1,275,308.34	3,166,381.41	
Point 7				0.00	579.61	3,193.66	1,269,909.00	3,166,479.11	
Point 8				0.00	-4,699.49	3,201.68	1,264,630.27	3,166,521.87	
Point 9				0.00	-4,652.02	-2,076.92	1,264,643.00	3,161,243.27	
Point 10				0.00	633.15	-2,063.69	1,269,927.94	3,161,221.73	
Point 11				0.00	579.64	3,193.62	1,269,909.03	3,166,479.07	
Point 12				0.00	633.15	-2,063.69	1,269,927.94	3,161,221.73	
Point 13				0.00	6,000.34	-2,130.33	1,275,294.37	3,161,119.78	
NRC 3C-32HZ_SHL - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	1,269,308.41	3,163,289.46	40.071167	-104.916530
NRC 3C-32HZ_BHL - actual wellpath misses target center by 45.03usft at 18671.00usft MD (7705.11 TVD, 11257.17 N, -192.68 E) - Point	0.00	0.00	7,694.00	11,269.37	-150.78	1,280,576.11	3,163,064.54	40.102102	-104.917069

Directional Difficulty Index

Average Dogleg over Survey:	1.48 °/100usft	Maximum Dogleg over Survey:	12.01 °/100usft at 7,891.00 usft
Net Tortosity applicable to Plans:	0.87 °/100usft	Directional Difficulty Index:	6.888

Audit Info

North Reference Sheet for Sec. 8-T1N-R67W - NRC 3C-32HZ - 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 = 25' @ 5059.00usft (H&P 308). Northing and Easting are relative to NRC 3C-32HZ

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: 0.99996173

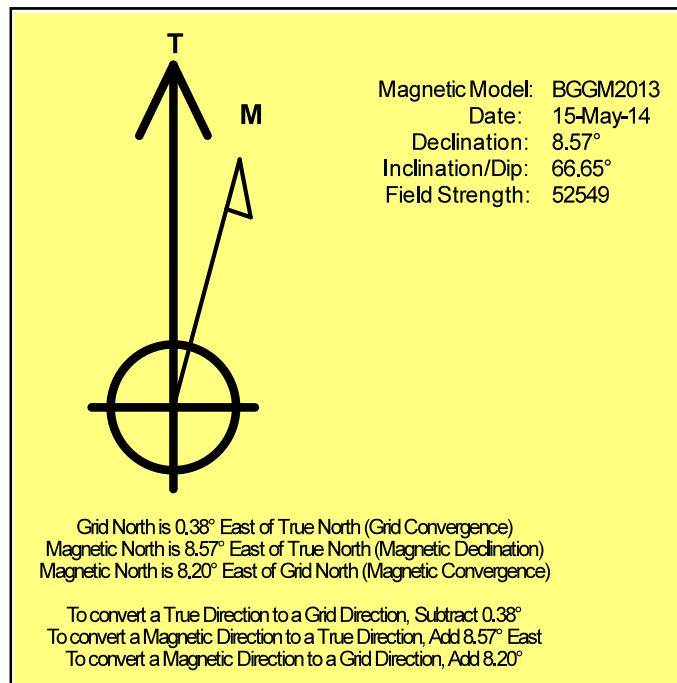
Grid Coordinates of Well: 1,269,308.40 usft N, 3,163,289.46 usft E

Geographical Coordinates of Well: 40° 04' 16.20" N, 104° 54' 59.51" W

Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 18,671.00usft the Bottom Hole Displacement is 11,258.82usft in the Direction of 359.02° (True).

Magnetic Convergence at surface is: -8.20° (15 May 2014, , BGGM2013)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 8-T1N-R67W

NRC 3C-32HZ

Plan A

Design: Actual Surveys

Sperry Drilling Services

Geodetic Report

16 June, 2014

Well Coordinates: 1,269,308.40 N, 3,163,289.46 E (40° 04' 16.20" N, 104° 54' 59.51" W)

Ground Level: 5,034.00 usft

Local Coordinate Origin:

Centered on Well NRC 3C-32HZ

Viewing Datum:

RKB = 25' @ 5059.00usft (H&P 308)

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 NRC 3C-32HZ - Actual 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	40.071167	-104.916530	1,269,308.40	3,163,289.46
25.00	0.00	0.00	25.00	0.00	0.00	40.071167	-104.916530	1,269,308.40	3,163,289.46
125.00	0.48	200.36	125.00	-0.39	-0.15	40.071166	-104.916531	1,269,308.01	3,163,289.32
225.00	0.52	185.47	225.00	-1.24	-0.33	40.071164	-104.916531	1,269,307.16	3,163,289.13
325.00	0.49	188.51	324.99	-2.11	-0.44	40.071161	-104.916532	1,269,306.29	3,163,289.03
425.00	0.51	181.42	424.99	-2.98	-0.52	40.071159	-104.916532	1,269,305.42	3,163,288.96
525.00	0.54	158.84	524.98	-3.86	-0.36	40.071156	-104.916532	1,269,304.54	3,163,289.13
625.00	0.49	170.38	624.98	-4.72	-0.11	40.071154	-104.916531	1,269,303.68	3,163,289.37
725.00	0.39	178.84	724.98	-5.49	-0.04	40.071152	-104.916530	1,269,302.92	3,163,289.46
825.00	0.25	181.44	824.97	-6.05	-0.04	40.071150	-104.916530	1,269,302.36	3,163,289.46
925.00	0.10	186.58	924.97	-6.35	-0.05	40.071150	-104.916530	1,269,302.05	3,163,289.45
1,025.00	0.10	198.42	1,024.97	-6.52	-0.09	40.071149	-104.916531	1,269,301.88	3,163,289.41
1,125.00	0.16	316.73	1,124.97	-6.50	-0.21	40.071149	-104.916531	1,269,301.90	3,163,289.29
1,161.00	0.10	307.63	1,160.97	-6.44	-0.27	40.071149	-104.916531	1,269,301.96	3,163,289.23
1,244.10	0.36	219.27	1,244.07	-6.60	-0.49	40.071149	-104.916532	1,269,301.80	3,163,289.01
1,296.00	0.59	213.20	1,295.97	-6.95	-0.74	40.071148	-104.916533	1,269,301.44	3,163,288.76
1,389.00	0.67	184.78	1,388.97	-7.90	-1.05	40.071145	-104.916534	1,269,300.50	3,163,288.46
1,481.00	0.62	213.29	1,480.96	-8.85	-1.37	40.071143	-104.916535	1,269,299.55	3,163,288.15
1,573.00	0.48	183.51	1,572.96	-9.65	-1.67	40.071141	-104.916536	1,269,298.74	3,163,287.86
1,759.00	0.48	245.39	1,758.95	-10.75	-2.42	40.071138	-104.916539	1,269,297.64	3,163,287.11
1,851.00	0.63	218.58	1,850.95	-11.31	-3.09	40.071136	-104.916541	1,269,297.08	3,163,286.44
1,942.00	1.88	289.62	1,941.93	-11.20	-4.81	40.071136	-104.916547	1,269,297.18	3,163,284.73
2,035.00	1.68	281.94	2,034.88	-10.40	-7.58	40.071138	-104.916557	1,269,297.95	3,163,281.95
2,128.00	1.79	291.33	2,127.84	-9.59	-10.26	40.071141	-104.916567	1,269,298.74	3,163,279.26
2,220.00	1.52	292.11	2,219.80	-8.61	-12.73	40.071143	-104.916576	1,269,299.71	3,163,276.78
2,311.00	1.28	292.26	2,310.77	-7.77	-14.79	40.071146	-104.916583	1,269,300.54	3,163,274.72
2,403.00	2.98	289.66	2,402.71	-6.58	-18.00	40.071149	-104.916595	1,269,301.71	3,163,271.51
2,495.00	4.03	286.34	2,494.53	-4.86	-23.35	40.071154	-104.916614	1,269,303.39	3,163,266.14
2,588.00	5.95	284.14	2,587.18	-2.77	-31.16	40.071159	-104.916642	1,269,305.43	3,163,258.32
2,680.00	7.78	281.06	2,678.51	-0.41	-41.90	40.071166	-104.916680	1,269,307.72	3,163,247.57
2,774.00	8.91	278.28	2,771.52	1.86	-55.35	40.071172	-104.916728	1,269,309.90	3,163,234.10
2,867.00	9.26	275.73	2,863.35	3.65	-69.92	40.071177	-104.916780	1,269,311.59	3,163,219.52
2,960.00	11.20	280.36	2,954.87	6.02	-86.25	40.071184	-104.916838	1,269,313.85	3,163,203.18
3,052.00	9.43	279.47	3,045.38	8.86	-102.47	40.071191	-104.916896	1,269,316.59	3,163,186.93
3,143.00	10.89	281.98	3,134.95	11.88	-118.24	40.071200	-104.916953	1,269,319.50	3,163,171.15
3,235.00	9.00	279.93	3,225.56	14.92	-133.83	40.071208	-104.917008	1,269,322.44	3,163,155.54
3,327.00	11.01	280.69	3,316.16	17.79	-149.55	40.071216	-104.917065	1,269,325.21	3,163,139.80
3,419.00	9.25	278.90	3,406.72	20.57	-165.49	40.071223	-104.917122	1,269,327.88	3,163,123.84
3,511.00	11.16	283.06	3,497.26	23.72	-181.47	40.071232	-104.917179	1,269,330.93	3,163,107.84
3,602.00	9.28	280.50	3,586.82	27.05	-197.26	40.071241	-104.917235	1,269,334.15	3,163,092.03
3,694.00	5.64	277.70	3,678.02	29.01	-209.04	40.071247	-104.917277	1,269,336.03	3,163,080.24
3,786.00	4.99	278.25	3,769.63	30.19	-217.48	40.071250	-104.917307	1,269,337.16	3,163,071.79

Design Report for NRC 3C-32HZ - Actual 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)
3,889.00	4.93	259.42	3,872.25	30.02	-226.27	40.071249	-104.917339	1,269,336.93	3,163,063.01
3,981.00	6.23	263.58	3,963.81	28.73	-235.11	40.071246	-104.917370	1,269,335.59	3,163,054.17
4,073.00	8.32	274.67	4,055.07	28.72	-246.71	40.071246	-104.917412	1,269,335.50	3,163,042.58
4,165.00	8.18	283.63	4,146.12	30.80	-259.70	40.071252	-104.917458	1,269,337.49	3,163,029.57
4,257.00	7.24	281.12	4,237.29	33.46	-271.75	40.071259	-104.917501	1,269,340.08	3,163,017.50
4,348.00	6.83	281.93	4,327.60	35.69	-282.67	40.071265	-104.917540	1,269,342.23	3,163,006.57
4,443.00	6.27	280.52	4,421.98	37.80	-293.30	40.071271	-104.917578	1,269,344.27	3,162,995.93
4,537.00	5.68	279.54	4,515.47	39.51	-302.94	40.071275	-104.917613	1,269,345.92	3,162,986.28
4,632.00	4.21	269.61	4,610.12	40.26	-311.06	40.071278	-104.917642	1,269,346.62	3,162,978.15
4,726.00	3.57	272.38	4,703.90	40.36	-317.43	40.071278	-104.917664	1,269,346.68	3,162,971.78
4,821.00	3.87	275.28	4,798.70	40.78	-323.58	40.071279	-104.917686	1,269,347.05	3,162,965.63
4,915.00	3.71	277.75	4,892.50	41.48	-329.75	40.071281	-104.917708	1,269,347.71	3,162,959.45
5,009.00	2.16	247.23	4,986.37	41.21	-334.40	40.071280	-104.917725	1,269,347.41	3,162,954.81
5,104.00	1.95	245.01	5,081.31	39.83	-337.52	40.071276	-104.917736	1,269,346.01	3,162,951.70
5,198.00	1.98	256.75	5,175.26	38.78	-340.55	40.071274	-104.917747	1,269,344.94	3,162,948.68
5,293.00	1.73	195.12	5,270.22	37.02	-342.52	40.071269	-104.917754	1,269,343.17	3,162,946.72
5,387.00	1.44	217.35	5,364.18	34.71	-343.61	40.071262	-104.917758	1,269,340.86	3,162,945.64
5,482.00	1.05	215.06	5,459.16	33.05	-344.83	40.071258	-104.917762	1,269,339.19	3,162,944.43
5,576.00	1.03	214.15	5,553.14	31.65	-345.80	40.071254	-104.917766	1,269,337.78	3,162,943.47
5,670.00	0.79	203.93	5,647.13	30.36	-346.54	40.071250	-104.917768	1,269,336.48	3,162,942.74
5,765.00	1.09	203.92	5,742.12	28.93	-347.17	40.071246	-104.917771	1,269,335.05	3,162,942.12
5,859.00	0.85	297.50	5,836.11	28.44	-348.15	40.071245	-104.917774	1,269,334.55	3,162,941.14
5,953.00	0.64	304.29	5,930.10	29.05	-349.20	40.071247	-104.917778	1,269,335.16	3,162,940.09
6,048.00	0.61	312.02	6,025.10	29.69	-350.02	40.071249	-104.917781	1,269,335.79	3,162,939.27
6,142.00	0.66	313.45	6,119.09	30.40	-350.78	40.071250	-104.917784	1,269,336.49	3,162,938.50
6,236.00	1.44	54.82	6,213.08	31.45	-350.21	40.071253	-104.917782	1,269,337.55	3,162,939.06
6,330.00	1.31	34.82	6,307.05	33.02	-348.63	40.071258	-104.917776	1,269,339.12	3,162,940.63
6,425.00	1.23	38.82	6,402.03	34.70	-347.37	40.071262	-104.917771	1,269,340.82	3,162,941.88
6,519.00	1.73	33.64	6,496.00	36.67	-345.95	40.071268	-104.917766	1,269,342.79	3,162,943.29
6,614.00	1.65	30.04	6,590.96	39.05	-344.47	40.071274	-104.917761	1,269,345.18	3,162,944.75
6,708.00	1.38	29.43	6,684.92	41.20	-343.24	40.071280	-104.917757	1,269,347.35	3,162,945.97
6,803.00	1.09	40.84	6,779.90	42.88	-342.09	40.071285	-104.917753	1,269,349.03	3,162,947.11
6,898.00	0.82	46.15	6,874.89	44.04	-341.00	40.071288	-104.917749	1,269,350.20	3,162,948.19
6,992.00	1.23	46.34	6,968.87	45.20	-339.79	40.071291	-104.917744	1,269,351.37	3,162,949.39
7,085.00	1.40	52.81	7,061.85	46.58	-338.16	40.071295	-104.917739	1,269,352.75	3,162,951.01
7,134.00	4.97	7.43	7,110.77	49.04	-337.41	40.071302	-104.917736	1,269,355.22	3,162,951.75
7,181.00	10.05	3.71	7,157.35	55.16	-336.88	40.071318	-104.917734	1,269,361.34	3,162,952.23
7,228.00	15.65	2.30	7,203.16	65.59	-336.36	40.071347	-104.917732	1,269,371.78	3,162,952.69
7,276.00	19.77	2.08	7,248.87	80.18	-335.81	40.071387	-104.917730	1,269,386.37	3,162,953.14
7,323.00	21.83	1.02	7,292.81	96.86	-335.36	40.071433	-104.917729	1,269,403.06	3,162,953.48
7,371.00	25.08	357.59	7,336.84	115.96	-335.63	40.071485	-104.917730	1,269,422.15	3,162,953.08
7,418.00	28.33	1.39	7,378.82	137.07	-335.78	40.071543	-104.917730	1,269,443.25	3,162,952.80

Design Report for NRC 3C-32HZ - Actual 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)
7,465.00	31.05	4.44	7,419.65	160.31	-334.57	40.071607	-104.917726	1,269,466.50	3,162,953.85
7,512.00	34.87	5.40	7,459.08	185.77	-332.37	40.071677	-104.917718	1,269,491.98	3,162,955.89
7,560.00	40.39	3.32	7,497.08	214.98	-330.17	40.071757	-104.917710	1,269,521.20	3,162,957.89
7,607.00	45.88	1.42	7,531.37	247.08	-328.87	40.071845	-104.917705	1,269,553.30	3,162,958.98
7,654.00	49.87	1.37	7,562.88	281.92	-328.02	40.071941	-104.917702	1,269,588.15	3,162,959.60
7,701.00	53.20	1.60	7,592.12	318.70	-327.07	40.072042	-104.917699	1,269,624.94	3,162,960.31
7,749.00	57.02	1.67	7,619.57	358.05	-325.95	40.072150	-104.917695	1,269,664.29	3,162,961.18
7,796.00	62.37	1.83	7,643.27	398.59	-324.71	40.072261	-104.917690	1,269,704.84	3,162,962.15
7,844.00	67.22	1.20	7,663.71	442.00	-323.56	40.072380	-104.917686	1,269,748.24	3,162,963.01
7,891.00	72.86	1.02	7,679.75	486.15	-322.71	40.072502	-104.917683	1,269,792.40	3,162,963.57
7,938.00	77.21	0.18	7,691.88	531.54	-322.24	40.072626	-104.917682	1,269,837.79	3,162,963.74
7,985.00	79.84	0.45	7,701.23	577.59	-321.98	40.072753	-104.917681	1,269,883.85	3,162,963.70
8,032.00	82.55	1.10	7,708.43	624.03	-321.35	40.072880	-104.917679	1,269,930.28	3,162,964.02
8,074.00	86.30	0.60	7,712.50	665.82	-320.73	40.072995	-104.917676	1,269,972.07	3,162,964.36
8,112.30	87.30	0.84	7,714.64	704.06	-320.25	40.073100	-104.917675	1,270,010.31	3,162,964.59
8,206.00	89.75	1.41	7,717.05	797.70	-318.42	40.073357	-104.917668	1,270,103.96	3,162,965.81
8,301.00	88.86	1.03	7,718.21	892.67	-316.40	40.073617	-104.917661	1,270,198.94	3,162,967.21
8,395.00	88.61	0.46	7,720.28	986.64	-315.17	40.073875	-104.917656	1,270,292.91	3,162,967.81
8,490.00	89.26	0.41	7,722.05	1,081.62	-314.45	40.074136	-104.917654	1,270,387.89	3,162,967.91
8,584.00	89.88	0.61	7,722.75	1,175.61	-313.62	40.074394	-104.917651	1,270,481.88	3,162,968.13
8,679.00	90.65	0.47	7,722.31	1,270.61	-312.72	40.074655	-104.917648	1,270,576.88	3,162,968.40
8,773.00	90.80	0.27	7,721.12	1,364.60	-312.11	40.074913	-104.917646	1,270,670.87	3,162,968.38
8,868.00	91.14	0.01	7,719.51	1,459.58	-311.88	40.075174	-104.917645	1,270,765.85	3,162,967.99
8,963.00	90.28	0.06	7,718.34	1,554.58	-311.82	40.075434	-104.917645	1,270,860.84	3,162,967.42
9,057.00	90.28	359.90	7,717.88	1,648.58	-311.86	40.075692	-104.917645	1,270,954.83	3,162,966.77
9,152.00	89.82	0.23	7,717.80	1,743.57	-311.75	40.075953	-104.917644	1,271,049.82	3,162,966.26
9,247.00	90.89	0.81	7,717.21	1,838.57	-310.89	40.076214	-104.917641	1,271,144.82	3,162,966.49
9,342.00	91.14	0.34	7,715.52	1,933.55	-309.93	40.076475	-104.917638	1,271,239.80	3,162,966.82
9,437.00	89.20	0.35	7,715.24	2,028.54	-309.36	40.076736	-104.917636	1,271,334.79	3,162,966.77
9,532.00	89.78	1.46	7,716.09	2,123.52	-307.86	40.076996	-104.917630	1,271,429.77	3,162,967.64
9,627.00	90.22	1.04	7,716.09	2,218.50	-305.79	40.077257	-104.917623	1,271,524.76	3,162,969.09
9,722.00	90.68	0.45	7,715.34	2,313.49	-304.55	40.077518	-104.917619	1,271,619.75	3,162,969.70
9,816.00	90.71	1.60	7,714.20	2,407.46	-302.87	40.077776	-104.917613	1,271,713.73	3,162,970.76
9,911.00	90.12	0.16	7,713.51	2,502.45	-301.41	40.078036	-104.917607	1,271,808.72	3,162,971.60
10,006.00	89.82	1.40	7,713.56	2,597.44	-300.12	40.078297	-104.917603	1,271,903.71	3,162,972.27
10,100.00	90.25	0.63	7,713.51	2,691.42	-298.46	40.078555	-104.917597	1,271,997.70	3,162,973.31
10,195.00	90.83	2.69	7,712.61	2,786.37	-295.70	40.078816	-104.917587	1,272,092.66	3,162,975.44
10,289.00	91.45	2.28	7,710.74	2,880.26	-291.63	40.079074	-104.917572	1,272,186.58	3,162,978.90
10,384.00	90.92	2.16	7,708.78	2,975.17	-287.95	40.079334	-104.917559	1,272,281.50	3,162,981.95
10,478.00	89.08	1.39	7,708.78	3,069.12	-285.04	40.079592	-104.917549	1,272,375.47	3,162,984.24
10,566.00	89.85	1.20	7,709.60	3,157.10	-283.05	40.079833	-104.917542	1,272,463.45	3,162,985.65
10,659.00	90.22	0.92	7,709.54	3,250.08	-281.33	40.080089	-104.917536	1,272,556.44	3,162,986.76

Design Report for NRC 3C-32HZ - Actual 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)
10,751.00	90.65	0.87	7,708.84	3,342.07	-279.89	40.080341	-104.917530	1,272,648.43	3,162,987.59
10,844.00	91.11	0.49	7,707.41	3,435.05	-278.79	40.080596	-104.917527	1,272,741.41	3,162,988.09
10,935.00	90.25	1.41	7,706.33	3,526.03	-277.28	40.080846	-104.917521	1,272,832.39	3,162,989.00
11,028.00	90.99	1.47	7,705.33	3,618.99	-274.94	40.081101	-104.917513	1,272,925.37	3,162,990.72
11,121.00	89.91	1.98	7,704.60	3,711.94	-272.14	40.081357	-104.917503	1,273,018.34	3,162,992.91
11,214.00	89.94	1.20	7,704.72	3,804.91	-269.56	40.081612	-104.917494	1,273,111.31	3,162,994.88
11,306.00	89.14	359.54	7,705.46	3,896.90	-268.97	40.081864	-104.917491	1,273,203.30	3,162,994.87
11,397.00	89.63	359.61	7,706.43	3,987.89	-269.64	40.082114	-104.917494	1,273,294.28	3,162,993.59
11,490.00	90.00	359.20	7,706.73	4,080.89	-270.61	40.082369	-104.917497	1,273,387.26	3,162,992.01
11,583.00	90.15	359.62	7,706.61	4,173.88	-271.57	40.082625	-104.917501	1,273,480.25	3,162,990.45
11,675.00	89.69	359.50	7,706.74	4,265.88	-272.27	40.082877	-104.917503	1,273,572.23	3,162,989.13
11,766.00	89.91	358.58	7,707.06	4,356.86	-273.80	40.083127	-104.917509	1,273,663.20	3,162,987.01
11,858.00	90.46	0.24	7,706.76	4,448.85	-274.75	40.083379	-104.917512	1,273,755.18	3,162,985.46
11,950.00	91.11	0.28	7,705.50	4,540.84	-274.33	40.083632	-104.917511	1,273,847.17	3,162,985.27
12,043.00	88.86	359.59	7,705.53	4,633.84	-274.43	40.083887	-104.917511	1,273,940.16	3,162,984.55
12,135.00	88.58	359.64	7,707.58	4,725.81	-275.05	40.084140	-104.917513	1,274,032.12	3,162,983.33
12,229.00	89.41	0.72	7,709.23	4,819.79	-274.76	40.084398	-104.917512	1,274,126.10	3,162,983.01
12,322.00	90.46	1.04	7,709.33	4,912.78	-273.33	40.084653	-104.917507	1,274,219.09	3,162,983.82
12,415.00	91.23	1.06	7,707.96	5,005.76	-271.62	40.084908	-104.917501	1,274,312.07	3,162,984.91
12,506.00	91.73	0.95	7,705.61	5,096.71	-270.03	40.085158	-104.917495	1,274,403.03	3,162,985.91
12,598.00	90.25	0.71	7,704.02	5,188.68	-268.70	40.085410	-104.917491	1,274,495.01	3,162,986.64
12,690.00	89.91	0.83	7,703.89	5,280.68	-267.46	40.085663	-104.917486	1,274,587.00	3,162,987.27
12,782.00	87.07	2.17	7,706.32	5,372.60	-265.05	40.085915	-104.917478	1,274,678.94	3,162,989.07
12,873.00	88.67	2.50	7,709.70	5,463.46	-261.35	40.086165	-104.917464	1,274,769.82	3,162,992.18
12,965.00	88.95	2.16	7,711.61	5,555.36	-257.61	40.086417	-104.917451	1,274,861.74	3,162,995.31
13,057.00	90.03	1.88	7,712.43	5,647.30	-254.37	40.086669	-104.917439	1,274,953.69	3,162,997.95
13,149.00	90.71	1.51	7,711.84	5,739.26	-251.65	40.086922	-104.917430	1,275,045.66	3,163,000.07
13,241.00	91.60	1.52	7,709.98	5,831.21	-249.21	40.087174	-104.917421	1,275,137.62	3,163,001.89
13,333.00	91.42	2.21	7,707.56	5,923.13	-246.22	40.087426	-104.917410	1,275,229.55	3,163,004.28
13,426.00	90.46	2.43	7,706.03	6,016.04	-242.46	40.087681	-104.917397	1,275,322.48	3,163,007.43
13,521.00	90.06	1.06	7,705.60	6,110.99	-239.56	40.087942	-104.917386	1,275,417.45	3,163,009.70
13,615.00	89.66	359.85	7,705.83	6,204.98	-238.82	40.088200	-104.917384	1,275,511.44	3,163,009.83
13,710.00	90.34	359.35	7,705.83	6,299.98	-239.48	40.088461	-104.917386	1,275,606.43	3,163,008.54
13,804.00	89.29	359.32	7,706.13	6,393.97	-240.57	40.088719	-104.917390	1,275,700.41	3,163,006.83
13,898.00	89.35	359.71	7,707.25	6,487.96	-241.37	40.088977	-104.917393	1,275,794.39	3,163,005.42
13,993.00	89.10	0.63	7,708.53	6,582.95	-241.08	40.089238	-104.917392	1,275,889.37	3,163,005.08
14,087.00	89.44	1.96	7,709.73	6,676.92	-238.96	40.089496	-104.917384	1,275,983.35	3,163,006.58
14,181.00	90.09	1.47	7,710.12	6,770.87	-236.15	40.089753	-104.917374	1,276,077.32	3,163,008.78
14,276.00	90.71	0.94	7,709.45	6,865.85	-234.15	40.090014	-104.917367	1,276,172.30	3,163,010.15
14,370.00	88.92	358.79	7,709.76	6,959.84	-234.37	40.090272	-104.917368	1,276,266.28	3,163,009.31
14,465.00	89.54	358.42	7,711.03	7,054.80	-236.68	40.090533	-104.917376	1,276,361.23	3,163,006.37
14,559.00	88.92	357.57	7,712.30	7,148.73	-239.97	40.090791	-104.917388	1,276,455.13	3,163,002.47

Design Report for NRC 3C-32HZ - Actual 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)
14,653.00	88.64	356.90	7,714.30	7,242.60	-244.51	40.091048	-104.917404	1,276,548.96	3,162,997.31
14,748.00	89.97	358.02	7,715.45	7,337.50	-248.71	40.091309	-104.917419	1,276,643.83	3,162,992.48
14,842.00	90.52	358.97	7,715.05	7,431.46	-251.18	40.091567	-104.917428	1,276,737.77	3,162,989.39
14,937.00	91.60	359.06	7,713.29	7,526.43	-252.82	40.091828	-104.917434	1,276,832.72	3,162,987.14
15,031.00	90.55	359.35	7,711.53	7,620.41	-254.12	40.092085	-104.917439	1,276,926.68	3,162,985.21
15,126.00	91.76	359.98	7,709.61	7,715.38	-254.68	40.092346	-104.917441	1,277,021.65	3,162,984.03
15,220.00	91.05	2.14	7,707.31	7,809.33	-252.94	40.092604	-104.917434	1,277,115.60	3,162,985.15
15,315.00	89.08	2.11	7,707.20	7,904.26	-249.41	40.092865	-104.917422	1,277,210.55	3,162,988.05
15,409.00	88.12	0.17	7,709.50	7,998.21	-247.55	40.093123	-104.917415	1,277,304.51	3,162,989.30
15,504.00	88.49	0.15	7,712.31	8,093.17	-247.28	40.093383	-104.917414	1,277,399.46	3,162,988.94
15,598.00	87.41	0.07	7,715.67	8,187.11	-247.10	40.093641	-104.917413	1,277,493.39	3,162,988.51
15,693.00	88.15	0.02	7,719.35	8,282.03	-247.03	40.093902	-104.917413	1,277,588.32	3,162,987.96
15,787.00	89.69	1.14	7,721.12	8,376.01	-246.07	40.094160	-104.917410	1,277,682.29	3,162,988.29
15,882.00	91.05	2.45	7,720.51	8,470.96	-243.10	40.094420	-104.917399	1,277,777.25	3,162,990.64
15,977.00	89.91	1.11	7,719.71	8,565.90	-240.15	40.094681	-104.917389	1,277,872.21	3,162,992.97
16,072.00	92.13	0.48	7,718.02	8,660.87	-238.83	40.094942	-104.917384	1,277,967.19	3,162,993.66
16,167.00	91.42	1.17	7,715.08	8,755.82	-237.46	40.095202	-104.917379	1,278,062.13	3,162,994.40
16,261.00	92.72	1.52	7,711.68	8,849.73	-235.26	40.095460	-104.917371	1,278,156.05	3,162,995.99
16,356.00	91.51	3.04	7,708.18	8,944.58	-231.48	40.095720	-104.917358	1,278,250.93	3,162,999.14
16,451.00	91.35	3.59	7,705.81	9,039.39	-225.99	40.095981	-104.917338	1,278,345.77	3,163,004.01
16,546.00	91.29	5.21	7,703.62	9,134.08	-218.70	40.096241	-104.917312	1,278,440.50	3,163,010.67
16,641.00	89.20	3.53	7,703.21	9,228.80	-211.46	40.096501	-104.917286	1,278,535.26	3,163,017.29
16,735.00	88.52	2.28	7,705.08	9,322.66	-206.70	40.096758	-104.917269	1,278,629.14	3,163,021.43
16,830.00	88.30	1.80	7,707.72	9,417.56	-203.32	40.097019	-104.917257	1,278,724.06	3,163,024.19
16,925.00	89.72	1.38	7,709.36	9,512.51	-200.69	40.097279	-104.917248	1,278,819.02	3,163,026.20
17,020.00	89.63	2.00	7,709.90	9,607.46	-197.88	40.097540	-104.917238	1,278,913.99	3,163,028.37
17,114.00	89.26	1.36	7,710.81	9,701.42	-195.13	40.097798	-104.917228	1,279,007.96	3,163,030.51
17,209.00	87.69	1.36	7,713.34	9,796.35	-192.87	40.098059	-104.917220	1,279,102.90	3,163,032.14
17,303.00	86.94	0.34	7,717.74	9,890.24	-191.48	40.098316	-104.917215	1,279,196.79	3,163,032.92
17,398.00	87.60	0.00	7,722.27	9,985.13	-191.20	40.098577	-104.917214	1,279,291.68	3,163,032.57
17,492.00	89.04	359.62	7,725.02	10,079.09	-191.51	40.098835	-104.917215	1,279,385.63	3,163,031.64
17,587.00	90.62	0.01	7,725.30	10,174.08	-191.82	40.099095	-104.917216	1,279,480.61	3,163,030.71
17,682.00	89.88	359.35	7,724.89	10,269.08	-192.35	40.099356	-104.917218	1,279,575.60	3,163,029.56
17,776.00	91.48	358.56	7,723.77	10,363.05	-194.06	40.099614	-104.917224	1,279,669.56	3,163,027.22
17,871.00	90.83	357.47	7,721.86	10,457.97	-197.35	40.099875	-104.917236	1,279,764.45	3,163,023.31
17,965.00	91.29	358.64	7,720.12	10,551.90	-200.54	40.100133	-104.917247	1,279,858.35	3,163,019.50
18,059.00	92.07	357.90	7,717.36	10,645.82	-203.38	40.100390	-104.917257	1,279,952.25	3,163,016.05
18,154.00	92.56	359.07	7,713.53	10,740.71	-205.89	40.100651	-104.917266	1,280,047.11	3,163,012.91
18,248.00	92.71	359.62	7,709.20	10,834.60	-206.96	40.100909	-104.917270	1,280,140.99	3,163,011.22
18,343.00	91.73	0.47	7,705.52	10,929.53	-206.89	40.101169	-104.917270	1,280,235.91	3,163,010.67
18,437.00	90.40	2.55	7,703.78	11,023.47	-204.41	40.101427	-104.917261	1,280,329.87	3,163,012.53
18,532.00	89.63	3.16	7,703.75	11,118.35	-199.68	40.101688	-104.917244	1,280,424.77	3,163,016.64

Design Report for NRC 3C-32HZ - Actual 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)
18,620.00	89.35	2.76	7,704.54	11,206.23	-195.13	40.101929	-104.917228	1,280,512.68	3,163,020.60
18,671.00	89.35	2.76	7,705.11	11,257.17	-192.68	40.102069	-104.917219	1,280,563.63	3,163,022.72

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,161.00	1,160.97	-6.44	-0.27	Tie-On to Gyro Surveys @ 1161.00ft
1,296.00	1,295.97	-6.95	-0.74	First MWD Survey @ 1296.00ft
18,620.00	7,704.54	11,206.23	-195.13	Final MWD Survey @ 18620.00ft
18,671.00	7,705.11	11,257.17	-192.68	Str Line Proj to Bit @ 18671' MD :: 7705.11' 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)	0.95	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
25.00	1,161.00	Surface Gyro Surveys	NS-GYRO-MS
1,296.00	8,206.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
8,301.00	18,620.00	MWD Lateral Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,244.10	1,244.07	9-5/8" Casing Set @ 1244.1' MD :: 1244.07' TVD	9-5/8	13-1/2
8,112.30	7,714.64	7" Casing Set @ 8112.3' MD :: 7714.05' TVD	7	8-3/4

Design Report for NRC 3C-32HZ - Actual Surveys

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:	1.48 °/100usft	Maximum Dogleg over Survey:	12.01 °/100usft at 7,891.00 usft
Net Tortosity applicable to Plans:	0.87 °/100usft	Directional Difficulty Index:	6.888

Audit Info

North Reference Sheet for Sec. 8-T1N-R67W - NRC 3C-32HZ - 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 = 25' @ 5059.00usft (H&P 308). Northing and Easting are relative to NRC 3C-32HZ

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: 0.99996173

Grid Coordinates of Well: 1,269,308.40 usft N, 3,163,289.46 usft E

Geographical Coordinates of Well: 40° 04' 16.20" N, 104° 54' 59.51" W

Grid Convergence at Surface is: 0.38°

Based upon Minimum Curvature type calculations, at a Measured Depth of 18,671.00usft

the Bottom Hole Displacement is 11,258.82usft in the Direction of 359.02° (True).

Magnetic Convergence at surface is: -8.20° (15 May 2014, , BGGM2013)

