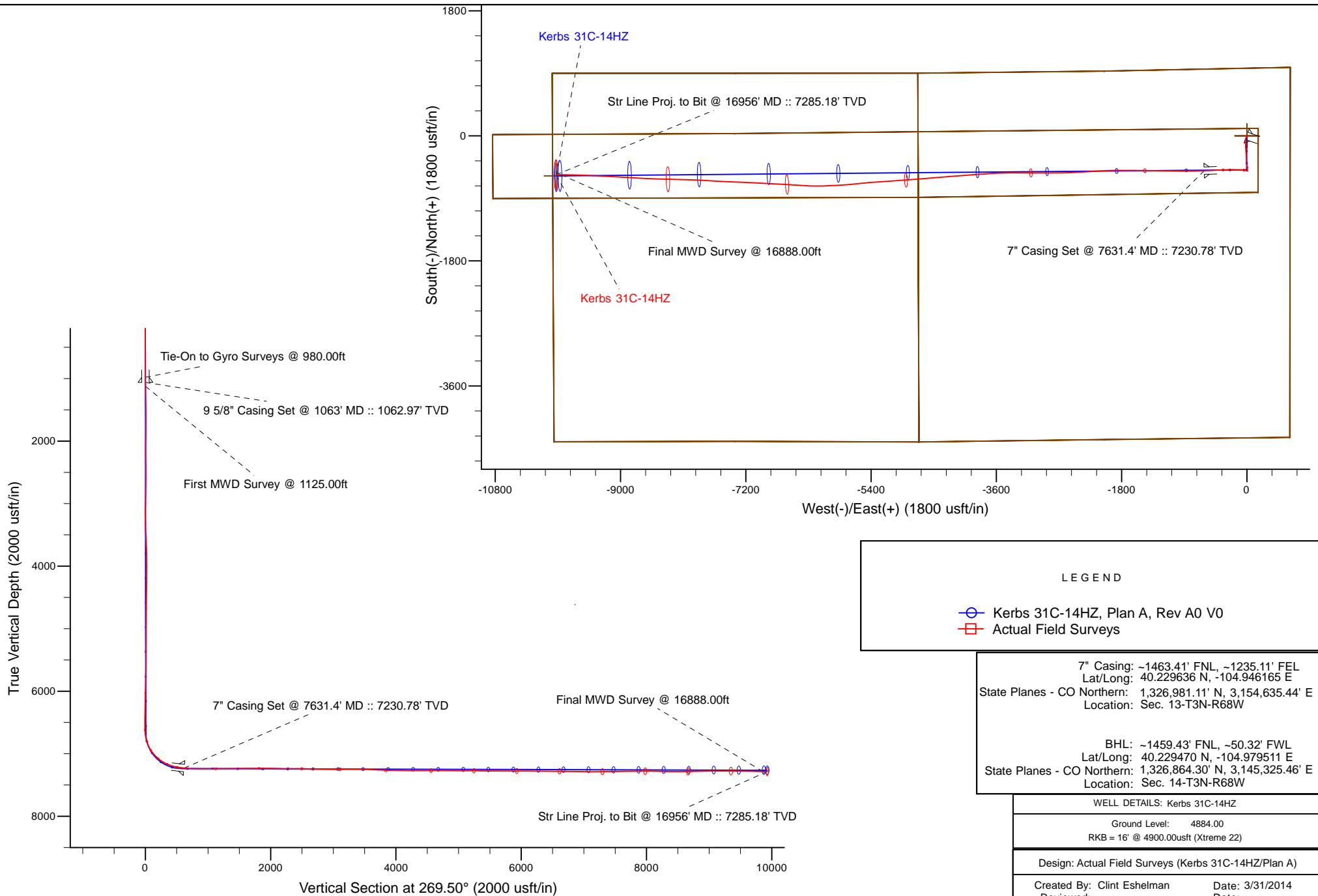


Project: Weld County, CO (NAD 83)
 Site: Sec. 13-T3N-R68W
 Well: Kerbs 31C-14HZ
 Wellbore: Plan A
 Design: Actual Field Surveys



LEGEND

- Kerbs 31C-14HZ, Plan A, Rev A0 V0
- Actual Field Surveys

7" Casing: ~1463.41' FNL, ~1235.11' FEL
 Lat/Long: 40.229636 N, -104.946165 E
 State Planes - CO Northern: 1,326,981.11' N, 3,154,635.44' E
 Location: Sec. 13-T3N-R68W

BHL: ~1459.43' FNL, ~50.32' FWL
 Lat/Long: 40.229470 N, -104.979511 E
 State Planes - CO Northern: 1,326,864.30' N, 3,145,325.46' E
 Location: Sec. 14-T3N-R68W

WELL DETAILS: Kerbs 31C-14HZ	
Ground Level: 4884.00	
RKB = 16' @ 4900.00usft (Xtreme 22)	
Design: Actual Field Surveys (Kerbs 31C-14HZ/Plan A)	
Created By: Clint Eshelman	Date: 3/31/2014
Reviewed: _____	Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 13-T3N-R68W

Kerbs 31C-14HZ

Plan A

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

31 March, 2014

Well Coordinates: 1,327,487.10 N, 3,155,246.22 E (40° 13' 51.65" N, 104° 56' 38.28" W)

Ground Level: 4,884.00 usft

Local Coordinate Origin:

Centered on Well Kerbs 31C-14HZ

Viewing Datum:

RKB = 16' @ 4900.00usft (Xtreme 22)

TVDs to System:

N

North Reference:

True

Unit System:

API US Survey Feet

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

HALLIBURTON

Design Report for Kerbs 31C-14HZ - 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
16.00	0.00	0.00	16.00	0.00	0.00	0.00	0.00
116.00	0.18	80.46	116.00	0.03	0.15	-0.16	0.18
216.00	0.42	129.10	216.00	-0.18	0.59	-0.59	0.33
316.00	0.75	171.77	315.99	-1.06	0.97	-0.96	0.53
416.00	0.55	269.79	415.99	-1.71	0.59	-0.57	0.99
516.00	0.59	176.75	515.99	-2.22	0.14	-0.12	0.83
616.00	0.71	279.22	615.98	-2.64	-0.45	0.47	1.02
716.00	0.21	131.75	715.98	-2.66	-0.92	0.95	0.89
816.00	0.54	304.25	815.98	-2.52	-1.17	1.20	0.75
916.00	0.56	216.49	915.98	-2.65	-1.85	1.88	0.76
980.00	0.66	268.84	979.97	-2.90	-2.41	2.43	0.85
Tie-On to Gyro Surveys @ 980.00ft							
1,063.00	0.51	289.66	1,062.97	-2.79	-3.23	3.26	0.31
9 5/8" Casing Set @ 1063' MD :: 1062.97' TVD							
1,125.00	0.46	312.05	1,124.97	-2.53	-3.68	3.70	0.31
First MWD Survey @ 1125.00ft							
1,314.00	1.24	331.40	1,313.94	-0.23	-5.22	5.22	0.43
1,503.00	1.08	255.82	1,502.92	1.13	-7.92	7.91	0.76
1,693.00	0.89	117.43	1,692.90	0.01	-8.35	8.35	0.97
1,876.00	0.46	154.93	1,875.89	-1.31	-6.78	6.79	0.33
2,058.00	0.62	142.11	2,057.88	-2.75	-5.86	5.89	0.11
2,241.00	0.38	235.91	2,240.88	-3.87	-5.76	5.79	0.41
2,424.00	0.50	250.45	2,423.87	-4.47	-7.01	7.05	0.09
2,606.00	0.16	214.55	2,605.87	-4.95	-7.91	7.95	0.21
2,789.00	1.63	80.80	2,788.85	-4.74	-5.48	5.52	0.95
2,971.00	1.21	72.40	2,970.79	-3.75	-1.09	1.13	0.26
3,153.00	0.26	162.07	3,152.78	-3.56	0.86	-0.83	0.68
3,325.00	1.52	222.34	3,324.75	-5.62	-0.55	0.60	0.82
3,496.00	5.45	210.67	3,495.41	-14.28	-6.22	6.35	2.32
3,667.00	8.38	200.51	3,665.15	-32.94	-14.73	15.02	1.85
3,839.00	11.04	187.30	3,834.69	-61.03	-21.22	21.75	2.01
4,010.00	9.24	174.03	4,003.04	-90.93	-21.87	22.67	1.72
4,181.00	10.35	175.16	4,171.54	-119.89	-19.15	20.19	0.66
4,352.00	11.00	177.00	4,339.58	-151.49	-17.00	18.32	0.43
4,524.00	10.81	176.78	4,508.48	-183.98	-15.23	16.84	0.11
4,695.00	11.13	176.98	4,676.35	-216.47	-13.46	15.35	0.19
4,867.00	10.37	176.14	4,845.33	-248.49	-11.55	13.72	0.45
5,038.00	10.36	173.57	5,013.54	-279.13	-8.79	11.22	0.27
5,209.00	10.05	181.12	5,181.84	-309.33	-7.36	10.06	0.80
5,380.00	10.50	176.23	5,350.10	-339.79	-6.63	9.59	0.57
5,552.00	9.75	179.88	5,519.43	-369.99	-5.57	8.79	0.57
5,723.00	9.89	172.92	5,687.93	-399.05	-3.72	7.21	0.70
5,894.00	9.65	173.38	5,856.45	-427.86	-0.26	4.00	0.15
6,065.00	9.08	170.20	6,025.17	-455.39	3.69	0.29	0.45
6,237.00	6.48	172.73	6,195.57	-478.40	7.23	-3.05	1.52
6,408.00	4.17	163.37	6,365.82	-493.93	10.23	-5.92	1.44
6,622.00	0.42	202.67	6,579.62	-502.11	12.15	-7.77	1.80
6,665.00	3.06	253.03	6,622.60	-502.59	10.99	-6.61	6.54
6,708.00	5.87	270.57	6,665.46	-502.90	7.70	-3.31	7.19

Design Report for Kerbs 31C-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
6,751.00	8.43	285.51	6,708.13	-502.04	2.46	1.92	7.31
6,794.00	11.49	285.39	6,750.48	-500.06	-4.71	9.07	7.12
6,837.00	15.91	280.38	6,792.24	-497.86	-14.64	18.99	10.63
6,879.00	20.22	278.53	6,832.16	-495.75	-27.49	31.81	10.35
6,922.00	24.17	276.13	6,871.97	-493.70	-43.60	47.90	9.42
6,965.00	28.00	274.25	6,910.58	-492.01	-62.42	66.71	9.11
7,008.00	33.13	271.11	6,947.60	-491.04	-84.25	88.53	12.49
7,050.00	37.74	270.28	6,981.81	-490.75	-108.59	112.87	11.04
7,093.00	41.42	271.56	7,014.95	-490.30	-135.98	140.26	8.77
7,136.00	45.27	272.64	7,046.21	-489.21	-165.47	169.73	9.12
7,179.00	49.41	270.66	7,075.35	-488.32	-197.07	201.32	10.21
7,222.00	53.79	269.37	7,102.05	-488.32	-230.76	235.01	10.45
7,265.00	58.36	269.24	7,126.04	-488.75	-266.43	270.68	10.63
7,307.00	62.64	268.81	7,146.72	-489.38	-302.97	307.23	10.23
7,350.00	66.59	267.54	7,165.15	-490.62	-341.79	346.06	9.57
7,393.00	69.43	267.56	7,181.25	-492.33	-381.62	385.90	6.60
7,436.00	72.95	267.53	7,195.11	-494.07	-422.28	426.57	8.19
7,479.00	77.25	266.94	7,206.17	-496.08	-463.77	468.09	10.09
7,522.00	79.48	268.01	7,214.84	-497.93	-505.85	510.17	5.73
7,575.00	81.67	267.56	7,223.52	-499.95	-558.09	562.43	4.22
7,631.40	83.53	267.88	7,230.78	-502.17	-613.97	618.33	3.35
7" Casing Set @ 7631.4' MD :: 7230.78' TVD							
7,798.00	89.04	268.82	7,241.56	-506.95	-780.09	784.48	3.35
7,969.00	89.72	270.21	7,243.41	-508.40	-951.07	955.47	0.90
8,141.00	90.77	271.30	7,242.68	-506.13	-1,123.05	1,127.42	0.88
8,312.00	91.42	270.91	7,239.41	-502.84	-1,293.98	1,298.32	0.44
8,484.00	91.02	270.46	7,235.75	-500.78	-1,465.93	1,470.24	0.35
8,655.00	89.85	270.71	7,234.45	-499.04	-1,636.91	1,641.20	0.70
8,826.00	89.69	269.92	7,235.14	-498.10	-1,807.91	1,812.18	0.47
8,998.00	89.91	268.61	7,235.74	-500.30	-1,979.89	1,984.18	0.77
9,169.00	88.00	266.05	7,238.86	-508.26	-2,150.65	2,155.00	1.87
9,340.00	90.77	267.30	7,240.69	-518.18	-2,321.33	2,325.77	1.78
9,512.00	89.20	266.35	7,240.74	-527.71	-2,493.06	2,497.57	1.07
9,683.00	88.40	269.93	7,244.32	-533.25	-2,663.91	2,668.46	2.14
9,855.00	88.61	269.00	7,248.81	-534.86	-2,835.84	2,840.40	0.55
10,031.00	90.34	270.88	7,250.42	-535.04	-3,011.82	3,016.37	1.45
10,123.00	89.97	270.15	7,250.17	-534.22	-3,103.81	3,108.35	0.89
10,307.00	90.99	271.04	7,248.63	-532.31	-3,287.79	3,292.31	0.74
10,489.00	88.52	267.86	7,249.41	-534.05	-3,469.74	3,474.27	2.21
10,672.00	87.22	267.36	7,256.21	-541.68	-3,652.45	3,657.04	0.76
10,854.00	88.24	265.33	7,263.42	-553.27	-3,833.93	3,838.61	1.25
11,037.00	88.58	265.80	7,268.50	-567.42	-4,016.31	4,021.11	0.32
11,220.00	90.28	266.15	7,270.32	-580.26	-4,198.84	4,203.74	0.95
11,402.00	89.97	265.50	7,269.92	-593.51	-4,380.36	4,385.37	0.40
11,579.00	89.69	264.84	7,270.44	-608.41	-4,556.73	4,561.86	0.41
11,751.00	89.75	265.44	7,271.29	-622.99	-4,728.10	4,733.36	0.35
11,922.00	89.66	265.43	7,272.17	-636.60	-4,898.56	4,903.93	0.05
12,093.00	89.97	266.75	7,272.72	-648.26	-5,069.16	5,074.62	0.79
12,264.00	89.97	266.31	7,272.81	-658.61	-5,239.84	5,245.39	0.26
12,436.00	89.17	265.00	7,274.10	-671.64	-5,411.34	5,416.99	0.89
12,607.00	89.66	264.00	7,275.84	-688.02	-5,581.54	5,587.33	0.65

Design Report for Kerbs 31C-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
12,778.00	90.22	265.81	7,276.02	-703.21	-5,751.86	5,757.77	1.11
12,950.00	89.29	266.93	7,276.76	-714.10	-5,923.51	5,929.51	0.85
13,121.00	89.20	267.61	7,279.01	-722.24	-6,094.30	6,100.37	0.40
13,293.00	89.66	272.80	7,280.72	-721.63	-6,266.23	6,272.29	3.03
13,464.00	90.74	274.02	7,280.13	-711.46	-6,436.92	6,442.88	0.95
13,635.00	88.21	273.63	7,281.69	-700.05	-6,607.51	6,613.37	1.50
13,806.00	89.01	272.52	7,285.84	-690.88	-6,778.21	6,783.99	0.80
13,978.00	88.95	273.08	7,288.90	-682.48	-6,949.98	6,955.67	0.33
14,149.00	90.68	272.73	7,289.46	-673.81	-7,120.75	7,126.36	1.03
14,320.00	90.62	271.93	7,287.52	-666.86	-7,291.60	7,297.14	0.47
14,492.00	90.96	272.47	7,285.14	-660.26	-7,463.46	7,468.93	0.37
14,663.00	90.86	273.41	7,282.43	-651.49	-7,634.21	7,639.60	0.55
14,834.00	90.15	273.07	7,280.92	-641.83	-7,804.93	7,810.23	0.46
15,005.00	90.49	271.83	7,279.97	-634.52	-7,975.76	7,981.00	0.75
15,177.00	88.95	271.83	7,280.81	-629.03	-8,147.67	8,152.85	0.90
15,348.00	88.77	271.49	7,284.21	-624.07	-8,318.56	8,323.69	0.22
15,519.00	89.72	271.70	7,286.46	-619.31	-8,489.48	8,494.56	0.57
15,690.00	91.48	273.00	7,284.67	-612.30	-8,660.32	8,665.33	1.28
15,862.00	91.23	273.22	7,280.60	-602.97	-8,832.01	8,836.94	0.19
16,033.00	91.11	273.47	7,277.11	-593.00	-9,002.69	9,007.52	0.16
16,204.00	89.29	273.17	7,276.52	-583.10	-9,173.39	9,178.13	1.08
16,375.00	89.94	272.47	7,277.67	-574.68	-9,344.18	9,348.84	0.56
16,546.00	89.41	272.05	7,278.64	-567.94	-9,515.04	9,519.64	0.40
16,718.00	88.74	271.23	7,281.41	-563.02	-9,686.95	9,691.49	0.62
16,888.00	89.29	270.22	7,284.33	-560.87	-9,856.91	9,861.42	0.68
Final MWD Survey @ 16888.00ft							
16,956.00	89.29	270.22	7,285.18	-560.61	-9,924.90	9,929.41	0.00
Str Line Proj. to Bit @ 16956' MD :: 7285.18' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
980.00	979.97	-2.90	-2.41	Tie-On to Gyro Surveys @ 980.00ft
1,125.00	1,124.97	-2.53	-3.68	First MWD Survey @ 1125.00ft
16,888.00	7,284.33	-560.87	-9,856.91	Final MWD Survey @ 16888.00ft
16,956.00	7,285.18	-560.61	-9,924.90	Str Line Proj. to Bit @ 16956' MD :: 7285.18' TVD

Vertical Section Information

User	Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
					+N/_S (usft)	+E/-W (usft)	
User		No Target (Freehand)	269.50	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
16.00	980.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,125.00	7,798.00	MWD Vertical/Build Surveys	MWD+IFR1
7,969.00	16,888.00	MWD Lateral Surveys	MWD+IFR1

Design Report for Kerbs 31C-14HZ - Actual Field Surveys**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,063.00	1,062.97	9 5/8" Casing Set @ 1063' MD :: 1062.97' TVD	9-5/8	13-1/2
7,631.40	7,230.78	7" Casing Set @ 7631.4' MD :: 7230.78' 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
Kerbs 31C-14HZ_SEC	0.00	0.00	0.00	0.00	0.00	1,327,487.10	3,155,246.22	40.23101398	-104.94396600
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	898.86	-9,982.46	1,328,323.31	3,145,258.75		
Point 2			0.00	900.39	-7,354.63	1,328,341.32	3,147,886.41		
Point 3			0.00	901.65	-4,727.18	1,328,359.05	3,150,513.68		
Point 4			0.00	-1,752.44	-4,720.38	1,325,705.17	3,150,537.13		
Point 5			0.00	-4,406.72	-4,713.55	1,323,051.10	3,150,560.60		
Point 6			0.00	-1,752.44	-4,720.38	1,325,705.17	3,150,537.13		
Point 7			0.00	901.65	-4,727.18	1,328,359.05	3,150,513.68		
Point 8			0.00	932.99	-2,051.80	1,328,407.17	3,153,188.70		
Point 9			0.00	986.20	623.09	1,328,477.14	3,155,863.09		
Point 10			0.00	-1,676.35	619.70	1,325,814.74	3,155,876.39		
Point 11			0.00	-4,339.24	616.40	1,323,152.00	3,155,889.79		
Point 12			0.00	-4,372.22	-2,047.94	1,323,102.31	3,153,225.82		
Point 13			0.00	-4,406.72	-4,713.55	1,323,051.10	3,150,560.60		
Point 14			0.00	-4,398.31	-7,359.14	1,323,042.92	3,147,915.12		
Point 15			0.00	-4,402.23	-9,955.67	1,323,022.72	3,145,318.78		
Point 16			0.00	-1,757.23	-9,969.02	1,325,667.47	3,145,288.85		
Kerbs 31C-14HZ_LD	0.00	0.00	0.00	0.00	0.00	1,327,487.10	3,155,246.22	40.23101398	-104.94396600
- actual wellpath hits target center									
- Polygon									
Point 1			0.00	-902.47	-10,832.79	1,326,516.76	3,144,419.77		
Point 2			0.00	17.59	-10,839.16	1,327,436.72	3,144,407.63		
Point 3			0.00	32.79	-7,355.37	1,327,473.77	3,147,891.11		
Point 4			0.00	107.16	161.95	1,327,595.27	3,155,407.49		
Point 5			0.00	-813.03	160.78	1,326,675.13	3,155,412.09		
Point 6			0.00	-885.41	-4,722.60	1,326,572.13	3,150,529.47		
Point 7			0.00	-902.47	-10,832.79	1,326,516.76	3,144,419.77		
Kerbs 31C-14HZ_SHL	0.00	0.00	0.00	0.00	0.00	1,327,487.10	3,155,246.22	40.23101398	-104.94396600
- actual wellpath hits target center									
- Point									
Kerbs 31C-14HZ_BHL	0.00	0.00	7,265.00	-576.15	-9,924.99	1,326,848.75	3,145,325.47	40.22942699	-104.97951100
- actual wellpath misses target center by 25.47usft at 16955.78usft MD (7285.17 TVD, -560.61 N, -9924.68 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.27 °/100usft	Maximum Dogleg over Survey:	12.49 °/100usft at 7,008.00 usft
Net Tortosity applicable to Plans:	0.58 °/100usft	Directional Difficulty Index:	6.722

Audit Info

North Reference Sheet for Sec. 13-T3N-R68W - Kerbs 31C-14HZ - 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 = 16' @ 4900.00usft (Xtreme 22). Northing and Easting are relative to Kerbs 31C-14HZ

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 -105.50000000°, Longitude Origin:0.00000000°, Latitude Origin:40.78333333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99995690

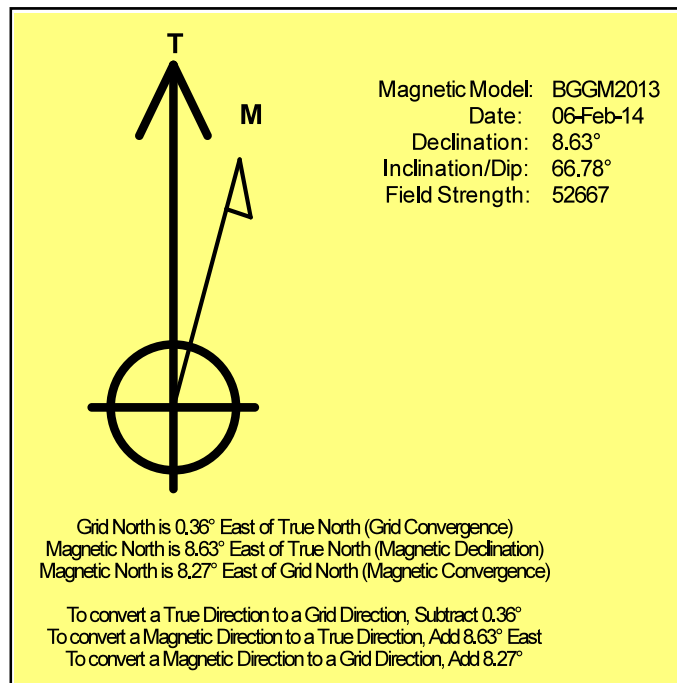
Grid Coordinates of Well: 1,327,487.10 usft N, 3,155,246.22 usft E

Geographical Coordinates of Well: 40° 13' 51.65" N, 104° 56' 38.28" W

Grid Convergence at Surface is: 0.36°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,956.00usft
the Bottom Hole Displacement is 9,940.72usft in the Direction of 266.77° (True).

Magnetic Convergence at surface is: -8.27° (6 February 2014, , BGGM2013)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)

Sec. 13-T3N-R68W

Kerbs 31C-14HZ

Plan A

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

31 March, 2014

Well Coordinates: 1,327,487.10 N, 3,155,246.22 E (40° 13' 51.65" N, 104° 56' 38.28" W)

Ground Level: 4,884.00 usft

Local Coordinate Origin:

Centered on Well Kerbs 31C-14HZ

Viewing Datum:

RKB = 16' @ 4900.00usft (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 Kerbs 31C-14HZ - 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	40.231014	-104.943966	1,327,487.10	3,155,246.22
16.00	0.00	0.00	16.00	0.00	0.00	40.231014	-104.943966	1,327,487.10	3,155,246.22
116.00	0.18	80.46	116.00	0.03	0.15	40.231014	-104.943966	1,327,487.13	3,155,246.38
216.00	0.42	129.10	216.00	-0.18	0.59	40.231014	-104.943964	1,327,486.92	3,155,246.82
316.00	0.75	171.77	315.99	-1.06	0.97	40.231011	-104.943963	1,327,486.05	3,155,247.20
416.00	0.55	269.79	415.99	-1.71	0.59	40.231009	-104.943964	1,327,485.39	3,155,246.82
516.00	0.59	176.75	515.99	-2.22	0.14	40.231008	-104.943966	1,327,484.88	3,155,246.37
616.00	0.71	279.22	615.98	-2.64	-0.45	40.231007	-104.943968	1,327,484.46	3,155,245.79
716.00	0.21	131.75	715.98	-2.66	-0.92	40.231007	-104.943970	1,327,484.43	3,155,245.32
816.00	0.54	304.25	815.98	-2.52	-1.17	40.231007	-104.943970	1,327,484.57	3,155,245.06
916.00	0.56	216.49	915.98	-2.65	-1.85	40.231007	-104.943973	1,327,484.44	3,155,244.38
980.00	0.66	268.84	979.97	-2.90	-2.41	40.231006	-104.943975	1,327,484.18	3,155,243.83
1,063.00	0.51	289.66	1,062.97	-2.79	-3.23	40.231006	-104.943978	1,327,484.29	3,155,243.01
1,125.00	0.46	312.05	1,124.97	-2.53	-3.68	40.231007	-104.943979	1,327,484.54	3,155,242.56
1,314.00	1.24	331.40	1,313.94	-0.23	-5.22	40.231013	-104.943985	1,327,486.84	3,155,241.00
1,503.00	1.08	255.82	1,502.92	1.13	-7.92	40.231017	-104.943995	1,327,488.18	3,155,238.29
1,693.00	0.89	117.43	1,692.90	0.01	-8.35	40.231014	-104.943996	1,327,487.06	3,155,237.87
1,876.00	0.46	154.93	1,875.89	-1.31	-6.78	40.231010	-104.943991	1,327,485.75	3,155,239.45
2,058.00	0.62	142.11	2,057.88	-2.75	-5.86	40.231007	-104.943987	1,327,484.32	3,155,240.37
2,241.00	0.38	235.91	2,240.88	-3.87	-5.76	40.231003	-104.943987	1,327,483.20	3,155,240.49
2,424.00	0.50	250.45	2,423.87	-4.47	-7.01	40.231002	-104.943991	1,327,482.58	3,155,239.24
2,606.00	0.16	214.55	2,605.87	-4.95	-7.91	40.231000	-104.943995	1,327,482.10	3,155,238.35
2,789.00	1.63	80.80	2,788.85	-4.74	-5.48	40.231001	-104.943986	1,327,482.32	3,155,240.77
2,971.00	1.21	72.40	2,970.79	-3.75	-1.09	40.231004	-104.943970	1,327,483.34	3,155,245.15
3,153.00	0.26	162.07	3,152.78	-3.56	0.86	40.231004	-104.943963	1,327,483.54	3,155,247.11
3,325.00	1.52	222.34	3,324.75	-5.62	-0.55	40.230999	-104.943968	1,327,481.48	3,155,245.70
3,496.00	5.45	210.67	3,495.41	-14.28	-6.22	40.230975	-104.943989	1,327,472.78	3,155,240.09
3,667.00	8.38	200.51	3,665.15	-32.94	-14.73	40.230924	-104.944019	1,327,454.07	3,155,231.69
3,839.00	11.04	187.30	3,834.69	-61.03	-21.22	40.230847	-104.944042	1,327,425.94	3,155,225.39
4,010.00	9.24	174.03	4,003.04	-90.93	-21.87	40.230764	-104.944045	1,327,396.04	3,155,224.92
4,181.00	10.35	175.16	4,171.54	-119.89	-19.15	40.230685	-104.944035	1,327,367.10	3,155,227.83
4,352.00	11.00	177.00	4,339.58	-151.49	-17.00	40.230598	-104.944027	1,327,335.52	3,155,230.17
4,524.00	10.81	176.78	4,508.48	-183.98	-15.23	40.230509	-104.944021	1,327,303.04	3,155,232.14
4,695.00	11.13	176.98	4,676.35	-216.47	-13.46	40.230420	-104.944014	1,327,270.56	3,155,234.12
4,867.00	10.37	176.14	4,845.33	-248.49	-11.55	40.230332	-104.944008	1,327,238.55	3,155,236.23
5,038.00	10.36	173.57	5,013.54	-279.13	-8.79	40.230248	-104.943998	1,327,207.93	3,155,239.18
5,209.00	10.05	181.12	5,181.84	-309.33	-7.36	40.230165	-104.943993	1,327,177.75	3,155,240.80
5,380.00	10.50	176.23	5,350.10	-339.79	-6.63	40.230081	-104.943990	1,327,147.29	3,155,241.73
5,552.00	9.75	179.88	5,519.43	-369.99	-5.57	40.229998	-104.943986	1,327,117.09	3,155,242.98
5,723.00	9.89	172.92	5,687.93	-399.05	-3.72	40.229919	-104.943980	1,327,088.05	3,155,245.00
5,894.00	9.65	173.38	5,856.45	-427.86	-0.26	40.229840	-104.943967	1,327,059.27	3,155,248.64
6,065.00	9.08	170.20	6,025.17	-455.39	3.69	40.229764	-104.943953	1,327,031.76	3,155,252.76

Design Report for Kerbs 31C-14HZ - 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)
6,237.00	6.48	172.73	6,195.57	-478.40	7.23	40.229701	-104.943940	1,327,008.78	3,155,256.45
6,408.00	4.17	163.37	6,365.82	-493.93	10.23	40.229658	-104.943930	1,326,993.27	3,155,259.54
6,622.00	0.42	202.67	6,579.62	-502.11	12.15	40.229636	-104.943923	1,326,985.10	3,155,261.52
6,665.00	3.06	253.03	6,622.60	-502.59	10.99	40.229634	-104.943927	1,326,984.61	3,155,260.37
6,708.00	5.87	270.57	6,665.46	-502.90	7.70	40.229634	-104.943939	1,326,984.27	3,155,257.07
6,751.00	8.43	285.51	6,708.13	-502.04	2.46	40.229636	-104.943957	1,326,985.11	3,155,251.83
6,794.00	11.49	285.39	6,750.48	-500.06	-4.71	40.229641	-104.943983	1,326,987.04	3,155,244.65
6,837.00	15.91	280.38	6,792.24	-497.86	-14.64	40.229647	-104.944019	1,326,989.18	3,155,234.70
6,879.00	20.22	278.53	6,832.16	-495.75	-27.49	40.229653	-104.944065	1,326,991.21	3,155,221.84
6,922.00	24.17	276.13	6,871.97	-493.70	-43.60	40.229659	-104.944122	1,326,993.15	3,155,205.72
6,965.00	28.00	274.25	6,910.58	-492.01	-62.42	40.229664	-104.944190	1,326,994.72	3,155,186.89
7,008.00	33.13	271.11	6,947.60	-491.04	-84.25	40.229666	-104.944268	1,326,995.56	3,155,165.05
7,050.00	37.74	270.28	6,981.81	-490.75	-108.59	40.229667	-104.944355	1,326,995.70	3,155,140.71
7,093.00	41.42	271.56	7,014.95	-490.30	-135.98	40.229668	-104.944453	1,326,995.98	3,155,113.32
7,136.00	45.27	272.64	7,046.21	-489.21	-165.47	40.229671	-104.944559	1,326,996.88	3,155,083.83
7,179.00	49.41	270.66	7,075.35	-488.32	-197.07	40.229674	-104.944672	1,326,997.58	3,155,052.23
7,222.00	53.79	269.37	7,102.05	-488.32	-230.76	40.229674	-104.944793	1,326,997.36	3,155,018.54
7,265.00	58.36	269.24	7,126.04	-488.75	-266.43	40.229672	-104.944920	1,326,996.71	3,154,982.88
7,307.00	62.64	268.81	7,146.72	-489.38	-302.97	40.229671	-104.945051	1,326,995.85	3,154,946.34
7,350.00	66.59	267.54	7,165.15	-490.62	-341.79	40.229667	-104.945190	1,326,994.36	3,154,907.53
7,393.00	69.43	267.56	7,181.25	-492.33	-381.62	40.229663	-104.945333	1,326,992.41	3,154,867.71
7,436.00	72.95	267.53	7,195.11	-494.07	-422.28	40.229658	-104.945479	1,326,990.41	3,154,827.07
7,479.00	77.25	266.94	7,206.17	-496.08	-463.77	40.229652	-104.945627	1,326,988.15	3,154,785.59
7,522.00	79.48	268.01	7,214.84	-497.93	-505.85	40.229647	-104.945778	1,326,986.03	3,154,743.53
7,575.00	81.67	267.56	7,223.52	-499.95	-558.09	40.229642	-104.945965	1,326,983.68	3,154,691.30
7,631.40	83.53	267.88	7,230.78	-502.17	-613.97	40.229636	-104.946165	1,326,981.11	3,154,635.44
7,798.00	89.04	268.82	7,241.56	-506.95	-780.09	40.229622	-104.946760	1,326,975.29	3,154,469.36
7,969.00	89.72	270.21	7,243.41	-508.40	-951.07	40.229618	-104.947372	1,326,972.77	3,154,298.40
8,141.00	90.77	271.30	7,242.68	-506.13	-1,123.05	40.229625	-104.947988	1,326,973.95	3,154,126.42
8,312.00	91.42	270.91	7,239.41	-502.84	-1,293.98	40.229634	-104.948600	1,326,976.18	3,153,955.47
8,484.00	91.02	270.46	7,235.75	-500.78	-1,465.93	40.229639	-104.949216	1,326,977.16	3,153,783.52
8,655.00	89.85	270.71	7,234.45	-499.04	-1,636.91	40.229644	-104.949829	1,326,977.83	3,153,612.54
8,826.00	89.69	269.92	7,235.14	-498.10	-1,807.91	40.229647	-104.950441	1,326,977.70	3,153,441.55
8,998.00	89.91	268.61	7,235.74	-500.30	-1,979.89	40.229641	-104.951057	1,326,974.41	3,153,269.60
9,169.00	88.00	266.05	7,238.86	-508.26	-2,150.65	40.229619	-104.951669	1,326,965.38	3,153,098.89
9,340.00	90.77	267.30	7,240.69	-518.18	-2,321.33	40.229591	-104.952280	1,326,954.40	3,152,928.28
9,512.00	89.20	266.35	7,240.74	-527.71	-2,493.06	40.229565	-104.952895	1,326,943.79	3,152,756.62
9,683.00	88.40	269.93	7,244.32	-533.25	-2,663.91	40.229550	-104.953507	1,326,937.17	3,152,585.83
9,855.00	88.61	269.00	7,248.81	-534.86	-2,835.84	40.229545	-104.954122	1,326,934.49	3,152,413.92
10,031.00	90.34	270.88	7,250.42	-535.04	-3,011.82	40.229545	-104.954753	1,326,933.20	3,152,237.95
10,123.00	89.97	270.15	7,250.17	-534.22	-3,103.81	40.229547	-104.955082	1,326,933.45	3,152,145.96
10,307.00	90.99	271.04	7,248.63	-532.31	-3,287.79	40.229552	-104.955741	1,326,934.21	3,151,961.98

Design Report for Kerbs 31C-14HZ - 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)
10,489.00	88.52	267.86	7,249.41	-534.05	-3,469.74	40.229547	-104.956393	1,326,931.32	3,151,780.05
10,672.00	87.22	267.36	7,256.21	-541.68	-3,652.45	40.229526	-104.957047	1,326,922.55	3,151,597.39
10,854.00	88.24	265.33	7,263.42	-553.27	-3,833.93	40.229495	-104.957697	1,326,909.82	3,151,416.00
11,037.00	88.58	265.80	7,268.50	-567.42	-4,016.31	40.229456	-104.958350	1,326,894.53	3,151,233.72
11,220.00	90.28	266.15	7,270.32	-580.26	-4,198.84	40.229420	-104.959004	1,326,880.55	3,151,051.28
11,402.00	89.97	265.50	7,269.92	-593.51	-4,380.36	40.229384	-104.959654	1,326,866.16	3,150,869.86
11,579.00	89.69	264.84	7,270.44	-608.41	-4,556.73	40.229343	-104.960286	1,326,850.15	3,150,693.60
11,751.00	89.75	265.44	7,271.29	-622.99	-4,728.10	40.229303	-104.960899	1,326,834.51	3,150,522.32
11,922.00	89.66	265.43	7,272.17	-636.60	-4,898.56	40.229265	-104.961510	1,326,819.83	3,150,351.96
12,093.00	89.97	266.75	7,272.72	-648.26	-5,069.16	40.229233	-104.962121	1,326,807.10	3,150,181.45
12,264.00	89.97	266.31	7,272.81	-658.61	-5,239.84	40.229205	-104.962732	1,326,795.68	3,150,010.84
12,436.00	89.17	265.00	7,274.10	-671.64	-5,411.34	40.229169	-104.963346	1,326,781.58	3,149,839.43
12,607.00	89.66	264.00	7,275.84	-688.02	-5,581.54	40.229124	-104.963956	1,326,764.12	3,149,669.35
12,778.00	90.22	265.81	7,276.02	-703.21	-5,751.86	40.229082	-104.964566	1,326,747.87	3,149,499.14
12,950.00	89.29	266.93	7,276.76	-714.10	-5,923.51	40.229052	-104.965180	1,326,735.90	3,149,327.57
13,121.00	89.20	267.61	7,279.01	-722.24	-6,094.30	40.229029	-104.965792	1,326,726.69	3,149,156.84
13,293.00	89.66	272.80	7,280.72	-721.63	-6,266.23	40.229031	-104.966408	1,326,726.23	3,148,984.91
13,464.00	90.74	274.02	7,280.13	-711.46	-6,436.92	40.229059	-104.967019	1,326,735.33	3,148,814.17
13,635.00	88.21	273.63	7,281.69	-700.05	-6,607.51	40.229090	-104.967630	1,326,745.66	3,148,643.51
13,806.00	89.01	272.52	7,285.84	-690.88	-6,778.21	40.229115	-104.968241	1,326,753.76	3,148,472.76
13,978.00	88.95	273.08	7,288.90	-682.48	-6,949.98	40.229138	-104.968857	1,326,761.08	3,148,300.96
14,149.00	90.68	272.73	7,289.46	-673.81	-7,120.75	40.229162	-104.969468	1,326,768.68	3,148,130.14
14,320.00	90.62	271.93	7,287.52	-666.86	-7,291.60	40.229181	-104.970080	1,326,774.56	3,147,959.26
14,492.00	90.96	272.47	7,285.14	-660.26	-7,463.46	40.229199	-104.970696	1,326,780.08	3,147,787.37
14,663.00	90.86	273.41	7,282.43	-651.49	-7,634.21	40.229223	-104.971307	1,326,787.78	3,147,616.58
14,834.00	90.15	273.07	7,280.92	-641.83	-7,804.93	40.229249	-104.971918	1,326,796.37	3,147,445.81
15,005.00	90.49	271.83	7,279.97	-634.52	-7,975.76	40.229269	-104.972530	1,326,802.61	3,147,274.94
15,177.00	88.95	271.83	7,280.81	-629.03	-8,147.67	40.229284	-104.973146	1,326,807.03	3,147,103.01
15,348.00	88.77	271.49	7,284.21	-624.07	-8,318.56	40.229297	-104.973758	1,326,810.91	3,146,932.09
15,519.00	89.72	271.70	7,286.46	-619.31	-8,489.48	40.229310	-104.974370	1,326,814.59	3,146,761.16
15,690.00	91.48	273.00	7,284.67	-612.30	-8,660.32	40.229329	-104.974982	1,326,820.53	3,146,590.29
15,862.00	91.23	273.22	7,280.60	-602.97	-8,832.01	40.229355	-104.975597	1,326,828.78	3,146,418.54
16,033.00	91.11	273.47	7,277.11	-593.00	-9,002.69	40.229382	-104.976208	1,326,837.69	3,146,247.82
16,204.00	89.29	273.17	7,276.52	-583.10	-9,173.39	40.229409	-104.976820	1,326,846.52	3,146,077.06
16,375.00	89.94	272.47	7,277.67	-574.68	-9,344.18	40.229432	-104.977431	1,326,853.86	3,145,906.23
16,546.00	89.41	272.05	7,278.64	-567.94	-9,515.04	40.229450	-104.978043	1,326,859.53	3,145,735.34
16,718.00	88.74	271.23	7,281.41	-563.02	-9,686.95	40.229463	-104.978659	1,326,863.38	3,145,563.41
16,888.00	89.29	270.22	7,284.33	-560.87	-9,856.91	40.229469	-104.979267	1,326,864.46	3,145,393.45
16,956.00	89.29	270.22	7,285.18	-560.61	-9,924.90	40.229470	-104.979511	1,326,864.30	3,145,325.46

Design Report for Kerbs 31C-14HZ - Actual Field Surveys

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
980.00	979.97	-2.90	-2.41	Tie-On to Gyro Surveys @ 980.00ft
1,125.00	1,124.97	-2.53	-3.68	First MWD Survey @ 1125.00ft
16,888.00	7,284.33	-560.87	-9,856.91	Final MWD Survey @ 16888.00ft
16,956.00	7,285.18	-560.61	-9,924.90	Str Line Proj. to Bit @ 16956' MD :: 7285.18' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	269.50	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
16.00	980.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,125.00	7,798.00	MWD Vertical/Build Surveys	MWD+IFR1
7,969.00	16,888.00	MWD Lateral Surveys	MWD+IFR1

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,063.00	1,062.97	9 5/8" Casing Set @ 1063' MD :: 1062.97' TVD	9-5/8	13-1/2
7,631.40	7,230.78	7" Casing Set @ 7631.4' MD :: 7230.78' TVD	7	8-3/4

Design Report for Kerbs 31C-14HZ - Actual Field 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:	1.27 °/100usft	Maximum Dogleg over Survey:	12.49 °/100usft at 7,008.00 usft
Net Tortosity applicable to Plans:	0.58 °/100usft	Directional Difficulty Index:	6.722

Audit Info

North Reference Sheet for Sec. 13-T3N-R68W - Kerbs 31C-14HZ - 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 = 16' @ 4900.00usft (Xtreme 22). Northing and Easting are relative to Kerbs 31C-14HZ

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: 0.99995690

Grid Coordinates of Well: 1,327,487.10 usft N, 3,155,246.22 usft E

Geographical Coordinates of Well: 40° 13' 51.65" N, 104° 56' 38.28" W

Grid Convergence at Surface is: 0.36°

Based upon Minimum Curvature type calculations, at a Measured Depth of 16,956.00usft

the Bottom Hole Displacement is 9,940.72usft in the Direction of 266.77° (True).

Magnetic Convergence at surface is: -8.27° (6 February 2014, , BGGM2013)

