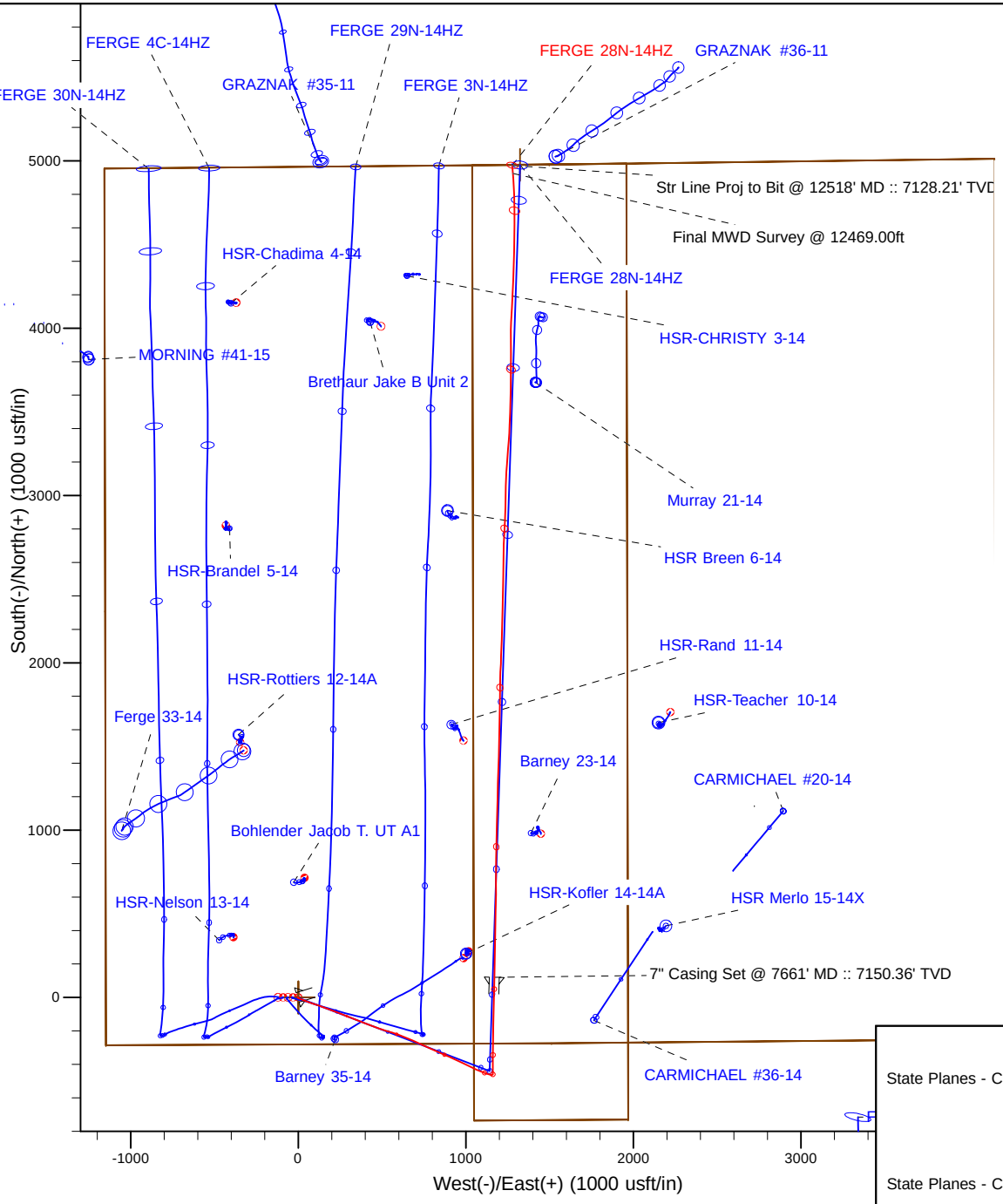
Project: Weld County, CO (NAD 83)
Site: Sec. 14-T3N-R66W
Well: FERGE 28N-14HZ
Wellbore: Plan C
Design: Actual Field Surveys

Anadarko Petroleum Corporation

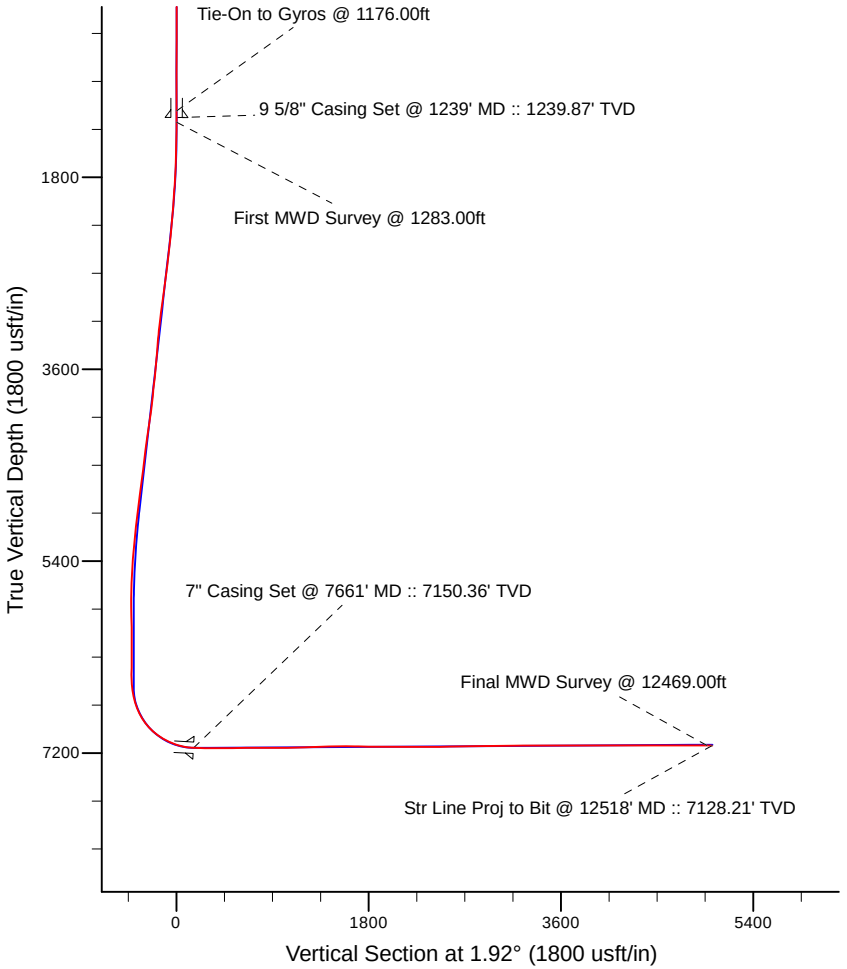
HALLIBURTON
Sperry Drilling



LEGEND

FERGE 28N-14HZ, Plan C, Rev C0 V0

Actual Field Surveys



7" Casing: ~395.26' FSL, ~2319.08' FWL
Lat/Long: 40.218919 N, -104.745502 E
State Planes - CO Northern: 1,323,490.70' N, 3,210,694.20' E
Location: Sec. 14-T3N-R66W

BHL: ~2.83' FNL, ~2433.67' FWL
Lat/Long: 40.232242 N, -104.745119 E
State Planes - CO Northern: 1,328,344.83' N, 3,210,759.83' E
Location: Sec. 14-T3N-R66W

WELL DETAILS: FERGE 28N-14HZ

Ground Level: 4913.00
RKB = 13' @ 4926.00usft (Ensign 132)

Design: Actual Field Surveys (FERGE 28N-14HZ/Plan C)

Created By: Clint Eshelman Date: 5/7/2014
Reviewed: _____ Date: _____

Anadarko Petroleum Corp.

Weld County, CO (NAD 83)
Sec. 14-T3N-R66W
FERGE 28N-14HZ

Plan C

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

07 May, 2014

Well Coordinates: 1,323,360.54 N, 3,209,524.67 E (40° 13' 06.92" N, 104° 44' 58.90" W)
Ground Level: 4,913.00 usft

Local Coordinate Origin:	Centered on Well FERGE 28N-14HZ
Viewing Datum:	RKB = 13' @ 4926.00usft (Ensign 132)
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 FERGE 28N-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
13.00	0.00	0.00	13.00	0.00	0.00	0.00	0.00
113.00	0.62	348.26	113.00	0.53	-0.11	0.53	0.62
213.00	0.38	129.27	213.00	0.85	0.04	0.85	0.95
313.00	0.65	243.89	312.99	0.39	-0.22	0.38	0.88
413.00	0.43	18.93	412.99	0.50	-0.60	0.47	1.00
513.00	0.67	196.46	512.99	0.29	-0.65	0.27	1.10
613.00	0.39	343.25	612.99	0.05	-0.91	0.02	1.02
713.00	0.50	171.54	712.99	-0.05	-0.95	-0.08	0.89
813.00	0.74	317.59	812.98	-0.01	-1.32	-0.05	1.19
913.00	0.29	193.27	912.98	0.22	-1.81	0.16	0.93
1,013.00	0.47	0.09	1,012.98	0.39	-1.87	0.33	0.76
1,113.00	0.60	230.30	1,112.98	0.46	-2.27	0.39	0.97
1,176.00	0.77	286.60	1,175.98	0.37	-2.93	0.28	1.05
Tie-On to Gyros @ 1176.00ft							
1,239.90	0.24	252.95	1,239.87	0.46	-3.47	0.34	0.92
9 5/8" Casing Set @ 1239' MD :: 1239.87' TVD							
1,283.00	0.29	155.81	1,282.97	0.33	-3.51	0.22	0.92
First MWD Survey @ 1283.00ft							
1,378.00	0.84	139.73	1,377.97	-0.42	-2.96	-0.52	0.60
1,479.00	2.58	120.58	1,478.92	-2.14	-0.52	-2.16	1.79
1,566.00	3.43	114.51	1,565.80	-4.22	3.53	-4.09	1.04
1,660.00	5.74	110.76	1,659.49	-7.05	10.49	-6.69	2.48
1,754.00	7.14	113.30	1,752.90	-11.03	20.25	-10.34	1.52
1,848.00	9.54	115.62	1,845.90	-16.71	32.64	-15.60	2.58
1,942.00	12.62	108.93	1,938.14	-23.41	49.38	-21.74	3.55
2,037.00	13.94	109.11	2,030.59	-30.52	70.01	-28.16	1.39
2,131.00	15.28	106.62	2,121.55	-37.77	92.58	-34.65	1.57
2,225.00	16.85	109.37	2,211.88	-45.83	117.30	-41.88	1.86
2,319.00	18.36	110.83	2,301.48	-55.62	143.99	-50.76	1.67
2,413.00	18.07	110.76	2,390.77	-66.05	171.46	-60.27	0.31
2,508.00	18.18	110.14	2,481.05	-76.37	199.15	-69.66	0.23
2,602.00	20.94	111.53	2,569.62	-87.59	228.55	-79.88	2.98
2,696.00	20.70	110.92	2,657.48	-99.68	259.69	-90.93	0.34
2,790.00	21.34	111.04	2,745.23	-111.76	291.18	-101.94	0.68
2,884.00	21.56	111.00	2,832.72	-124.09	323.26	-113.19	0.23
2,979.00	21.77	111.54	2,921.00	-136.81	355.95	-124.81	0.30
3,074.00	21.92	112.54	3,009.18	-150.08	388.71	-136.97	0.42
3,169.00	19.98	110.72	3,097.90	-162.62	420.27	-148.44	2.15
3,264.00	19.93	110.11	3,187.20	-173.93	450.66	-158.73	0.23
3,359.00	18.64	109.05	3,276.86	-184.45	480.21	-168.26	1.41
3,454.00	16.31	107.50	3,367.47	-193.42	507.29	-176.31	2.50
3,549.00	17.09	106.37	3,458.47	-201.36	533.41	-183.38	0.89
3,644.00	17.35	107.42	3,549.21	-209.54	560.31	-190.65	0.43
3,740.00	18.20	110.77	3,640.63	-219.14	587.99	-199.32	1.38
3,835.00	18.81	112.29	3,730.71	-230.21	616.03	-209.44	0.82
3,930.00	16.74	109.17	3,821.18	-240.51	643.13	-218.83	2.40
4,025.00	18.11	113.25	3,911.82	-250.83	669.62	-228.26	1.93
4,120.00	20.58	114.69	4,001.45	-263.64	698.36	-240.09	2.65
4,215.00	21.08	114.47	4,090.24	-277.69	729.08	-253.11	0.53

Design Report for FERGE 28N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,310.00	20.40	114.62	4,179.08	-291.67	759.69	-266.05	0.72
4,405.00	18.47	114.72	4,268.66	-304.86	788.41	-278.27	2.03
4,500.00	18.71	115.05	4,358.71	-317.60	815.88	-290.09	0.28
4,596.00	19.35	112.77	4,449.46	-330.28	844.50	-301.80	1.02
4,691.00	18.60	112.30	4,539.30	-342.12	873.03	-312.68	0.81
4,786.00	18.67	113.60	4,629.32	-353.95	900.98	-323.57	0.44
4,880.00	18.70	114.42	4,718.37	-366.21	928.49	-334.89	0.28
4,975.00	18.12	115.21	4,808.50	-378.80	955.72	-346.56	0.66
5,070.00	17.15	115.74	4,899.04	-391.17	981.70	-358.06	1.03
5,165.00	15.78	116.53	4,990.14	-403.02	1,005.88	-369.10	1.46
5,260.00	15.20	117.44	5,081.69	-414.53	1,028.49	-379.84	0.66
5,355.00	14.95	113.02	5,173.42	-425.06	1,050.82	-389.62	1.24
5,450.00	14.08	112.75	5,265.39	-434.33	1,072.76	-398.14	0.92
5,545.00	12.89	113.40	5,357.77	-443.00	1,093.14	-406.13	1.26
5,640.00	11.50	110.24	5,450.62	-450.49	1,111.75	-412.99	1.62
5,735.00	8.83	108.22	5,544.12	-456.04	1,127.56	-418.01	2.84
5,831.00	7.44	104.13	5,639.16	-459.87	1,140.59	-421.39	1.57
5,926.00	4.68	101.18	5,733.62	-462.12	1,150.36	-423.32	2.92
6,021.00	3.34	72.65	5,828.39	-462.05	1,156.80	-423.03	2.49
6,116.00	0.94	58.79	5,923.32	-460.82	1,160.11	-421.69	2.57
6,211.00	0.50	34.37	6,018.31	-460.07	1,161.01	-420.91	0.55
6,306.00	0.30	22.40	6,113.31	-459.50	1,161.34	-420.33	0.23
6,401.00	0.14	327.34	6,208.31	-459.17	1,161.37	-420.00	0.26
6,497.00	0.28	337.66	6,304.31	-458.85	1,161.22	-419.69	0.15
6,592.00	0.20	76.49	6,399.31	-458.60	1,161.29	-419.44	0.39
6,687.00	0.25	41.14	6,494.31	-458.41	1,161.59	-419.23	0.15
6,735.00	2.13	2.75	6,542.29	-457.44	1,161.70	-418.26	4.04
6,781.00	5.19	358.37	6,588.19	-454.50	1,161.68	-415.33	6.68
6,829.00	10.11	358.87	6,635.75	-448.12	1,161.54	-408.95	10.25
6,877.00	13.45	358.03	6,682.74	-438.32	1,161.26	-399.17	6.97
6,925.00	16.88	358.93	6,729.06	-425.77	1,160.94	-386.64	7.16
6,972.00	21.51	358.92	6,773.43	-410.33	1,160.65	-371.21	9.85
7,020.00	25.68	0.59	6,817.41	-391.12	1,160.59	-352.01	8.80
7,067.00	30.34	1.99	6,858.89	-369.06	1,161.11	-329.95	10.01
7,115.00	34.48	1.59	6,899.41	-343.35	1,161.91	-304.23	8.64
7,162.00	39.33	0.30	6,936.98	-315.14	1,162.36	-276.02	10.45
7,210.00	44.69	359.40	6,972.63	-283.03	1,162.26	-243.93	11.24
7,257.00	49.47	1.29	7,004.63	-248.63	1,162.49	-209.54	10.59
7,305.00	53.84	2.12	7,034.40	-211.01	1,163.62	-171.90	9.20
7,352.00	59.10	1.45	7,060.36	-171.86	1,164.83	-132.74	11.25
7,400.00	63.36	1.56	7,083.45	-129.81	1,165.93	-90.67	8.88
7,447.00	66.18	0.55	7,103.48	-87.31	1,166.71	-48.17	6.31
7,495.00	71.54	0.59	7,120.79	-42.55	1,167.16	-3.43	11.17
7,542.00	77.01	0.93	7,133.52	2.67	1,167.76	41.79	11.66
7,590.00	80.30	1.51	7,142.96	49.71	1,168.76	88.84	6.96
7,625.00	84.44	1.49	7,147.61	84.38	1,169.67	123.52	11.83
7,661.00	86.78	1.61	7,150.36	120.26	1,170.64	159.41	6.52
7" Casing Set @ 7661' MD :: 7150.36' TVD							
7,682.00	88.15	1.68	7,151.29	141.23	1,171.24	180.39	6.52
7,777.00	89.45	0.75	7,153.28	236.19	1,173.26	275.36	1.68
7,872.00	90.56	1.21	7,153.27	331.17	1,174.88	370.35	1.26

Design Report for FERGE 28N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
7,967.00	89.85	1.09	7,152.93	426.15	1,176.79	465.34	0.76
8,062.00	91.20	1.11	7,152.06	521.13	1,178.61	560.32	1.42
8,157.00	90.59	0.62	7,150.58	616.10	1,180.05	655.29	0.82
8,252.00	88.80	359.48	7,151.09	711.10	1,180.13	750.24	2.23
8,347.00	91.08	1.12	7,151.19	806.08	1,180.63	845.19	2.96
8,442.00	89.45	0.77	7,150.75	901.07	1,182.19	940.17	1.75
8,538.00	90.59	1.66	7,150.71	997.04	1,184.23	1,036.16	1.51
8,633.00	92.13	2.12	7,148.46	1,091.96	1,187.36	1,131.13	1.69
8,728.00	92.28	0.44	7,144.80	1,186.86	1,189.48	1,226.05	1.77
8,823.00	92.62	1.73	7,140.74	1,281.76	1,191.28	1,320.95	1.40
8,918.00	91.75	1.69	7,137.12	1,376.65	1,194.11	1,415.88	0.92
9,013.00	89.97	2.17	7,135.69	1,471.58	1,197.31	1,510.87	1.94
9,108.00	90.31	1.21	7,135.46	1,566.53	1,200.11	1,605.86	1.07
9,204.00	88.18	1.19	7,136.73	1,662.50	1,202.12	1,701.84	2.22
9,299.00	88.27	0.15	7,139.67	1,757.45	1,203.23	1,796.77	1.10
9,394.00	89.60	0.54	7,141.43	1,852.43	1,203.81	1,891.72	1.46
9,489.00	90.68	3.01	7,141.20	1,947.37	1,206.75	1,986.71	2.84
9,584.00	90.74	1.87	7,140.02	2,042.28	1,210.79	2,081.70	1.20
9,679.00	89.32	2.36	7,139.98	2,137.21	1,214.30	2,176.69	1.58
9,774.00	88.80	1.47	7,141.53	2,232.14	1,217.47	2,271.68	1.08
9,870.00	90.37	1.32	7,142.23	2,328.11	1,219.81	2,367.67	1.64
9,965.00	91.08	0.71	7,141.03	2,423.08	1,221.49	2,462.65	0.99
10,060.00	91.48	1.98	7,138.90	2,518.03	1,223.72	2,557.62	1.40
10,165.00	90.68	359.59	7,136.93	2,622.99	1,225.16	2,662.57	2.40
10,250.00	91.88	2.46	7,135.03	2,707.95	1,226.68	2,747.53	3.66
10,345.00	91.39	3.11	7,132.32	2,802.80	1,231.29	2,842.48	0.86
10,440.00	90.99	2.10	7,130.34	2,897.68	1,235.61	2,937.45	1.14
10,536.00	89.26	0.69	7,130.13	2,993.64	1,237.95	3,033.44	2.32
10,631.00	89.97	1.78	7,130.77	3,088.62	1,239.99	3,128.43	1.37
10,726.00	90.49	4.42	7,130.39	3,183.47	1,245.13	3,223.40	2.83
10,821.00	90.46	4.67	7,129.60	3,278.17	1,252.66	3,318.30	0.27
10,916.00	90.28	3.12	7,128.99	3,372.94	1,259.11	3,413.23	1.64
11,011.00	90.09	1.92	7,128.68	3,467.85	1,263.29	3,508.23	1.28
11,106.00	90.22	1.33	7,128.43	3,562.81	1,265.98	3,603.22	0.64
11,202.00	90.37	1.70	7,127.93	3,658.77	1,268.52	3,699.22	0.42
11,297.00	89.97	359.50	7,127.65	3,753.76	1,269.51	3,794.19	2.35
11,392.00	90.28	359.80	7,127.44	3,848.76	1,268.93	3,889.11	0.45
11,487.00	89.60	359.27	7,127.54	3,943.76	1,268.16	3,984.03	0.91
11,582.00	89.97	3.17	7,127.90	4,038.72	1,270.19	4,079.00	4.12
11,677.00	90.43	3.66	7,127.57	4,133.55	1,275.84	4,173.97	0.71
11,772.00	90.19	2.31	7,127.05	4,228.41	1,280.79	4,268.95	1.44
11,867.00	90.43	2.21	7,126.54	4,323.34	1,284.54	4,363.95	0.27
11,962.00	89.82	1.20	7,126.33	4,418.29	1,287.36	4,458.94	1.24
12,057.00	89.75	0.95	7,126.69	4,513.28	1,289.15	4,553.93	0.27
12,152.00	90.22	0.92	7,126.71	4,608.26	1,290.70	4,648.92	0.50
12,247.00	89.91	359.21	7,126.60	4,703.26	1,290.80	4,743.87	1.83
12,342.00	89.60	357.54	7,127.01	4,798.22	1,288.11	4,838.68	1.79
12,437.00	89.66	356.75	7,127.62	4,893.10	1,283.38	4,933.35	0.83
12,469.00	89.57	355.48	7,127.84	4,925.02	1,281.21	4,965.18	3.98
Final MWD Survey @ 12469.00ft							
12,518.00	89.57	355.48	7,128.21	4,973.87	1,277.35	5,013.87	0.00

Design Report for FERGE 28N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
Str Line Proj to Bit @ 12518' MD :: 7128.21' TVD							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,176.00	1,175.98	0.37	-2.93	Tie-On to Gyros @ 1176.00ft
1,283.00	1,282.97	0.33	-3.51	First MWD Survey @ 1283.00ft
12,469.00	7,127.84	4,925.02	1,281.21	Final MWD Survey @ 12469.00ft
12,518.00	7,128.21	4,973.87	1,277.35	Str Line Proj to Bit @ 12518' MD :: 7128.21' 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)	1.92	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	1,176.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,283.00	7,625.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
7,682.00	12,469.00	MWD Lateral Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,239.90	1,239.87	9 5/8" Casing Set @ 1239' MD :: 1239.87' TVD	9-5/8	13-1/2
7,661.00	7,150.36	7" Casing Set @ 7661' MD :: 7150.36' TVD	7	8-3/4

Design Report for FERGE 28N-14HZ - Actual Field Surveys

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FERGE 28N-14HZ_SE	0.00	0.00	0.00	0.00	0.00	1,323,360.55	3,209,524.67	40.218589	-104.749694
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	4,954.60	-1,156.40	1,328,304.97	3,208,326.44	
Point 2				0.00	4,978.71	1,498.60	1,328,351.54	3,210,981.03	
Point 3				0.00	5,013.67	4,154.20	1,328,408.97	3,213,636.12	
Point 4				0.00	2,375.26	4,159.81	1,325,770.81	3,213,664.05	
Point 5				0.00	-249.45	4,171.75	1,323,146.41	3,213,698.20	
Point 6				0.00	-273.47	1,511.44	1,323,099.89	3,211,038.30	
Point 7				0.00	-285.63	-1,147.84	1,323,065.23	3,208,379.34	
Point 8				0.00	2,310.66	-1,152.36	1,325,661.27	3,208,352.85	
FERGE 28N-14HZ_LC	0.00	0.00	0.00	0.00	0.00	1,323,360.55	3,209,524.67	40.218589	-104.749694
- actual wellpath hits target center									
- Polygon									
Point 1				0.00	-735.67	1,049.64	1,322,633.82	3,210,580.45	
Point 2				0.00	-729.42	1,969.72	1,322,647.85	3,211,500.40	
Point 3				0.00	4,984.76	1,958.61	1,328,361.49	3,211,440.95	
Point 4				0.00	4,974.53	1,038.59	1,328,343.47	3,210,521.09	
FERGE 28N-14HZ_SH	0.00	0.00	0.00	0.00	0.00	1,323,360.55	3,209,524.67	40.218589	-104.749694
- actual wellpath hits target center									
- Point									
FERGE 28N-14HZ BH	0.00	0.00	7,121.00	4,976.03	1,323.74	1,328,347.38	3,210,806.20	40.232248	-104.744953
- actual wellpath misses target center by 46.97usft at 12516.45usft MD (7128.20 TVD, 4972.32 N, 1277.47 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.92 °/100usft	Maximum Dogleg over Survey:	11.83 °/100usft at 7,625.00 usft
Net Tortousity applicable to Plans:	0.80 °/100usft	Directional Difficulty Index:	6.450

Audit Info

North Reference Sheet for Sec. 14-T3N-R66W - FERGE 28N-14HZ - Plan C

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

Vertical Depths are relative to RKB = 13' @ 4926.00usft (Ensign 132). Northing and Easting are relative to FERGE 28N-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: 0.99995700

Grid Coordinates of Well: 1,323,360.54 usft N, 3,209,524.67 usft E

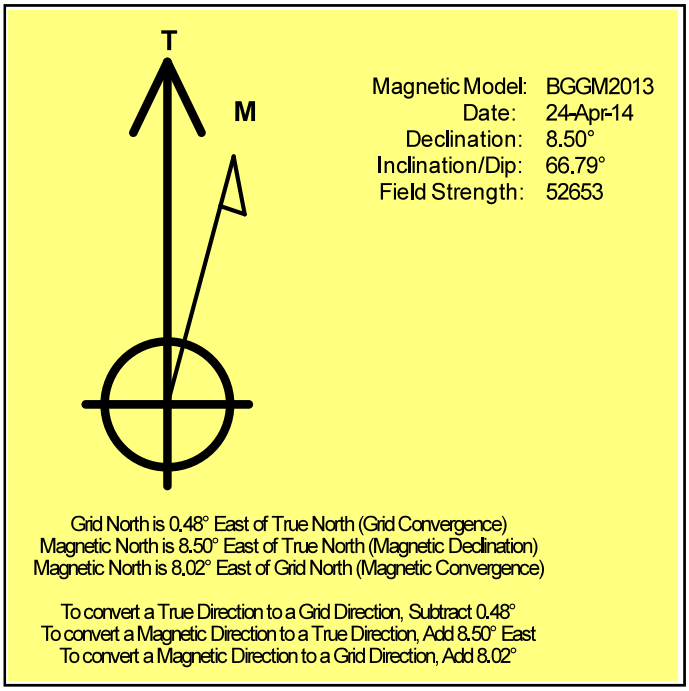
Geographical Coordinates of Well: 40° 13' 06.92" N, 104° 44' 58.90" W

Grid Convergence at Surface is: 0.48°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,518.00usft

the Bottom Hole Displacement is 5,135.27usft in the Direction of 14.40° (True).

Magnetic Convergence at surface is: -8.02° (24 April 2014, , BGGM2013)



Anadarko Petroleum Corp.

Weld County, CO (NAD 83)
Sec. 14-T3N-R66W
FERGE 28N-14HZ

Plan C

Design: Actual Field Surveys

Sperry Drilling Services

Geodetic Report

07 May, 2014

Well Coordinates: 1,323,360.54 N, 3,209,524.67 E (40° 13' 06.92" N, 104° 44' 58.90" W)
Ground Level: 4,913.00 usft

Local Coordinate Origin:	Centered on Well FERGE 28N-14HZ
Viewing Datum:	RKB = 13' @ 4926.00usft (Ensign 132)
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 FERGE 28N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	40.218589	-104.749694	1,323,360.54	3,209,524.67
13.00	0.00	0.00	13.00	0.00	0.00	40.218589	-104.749694	1,323,360.54	3,209,524.67
113.00	0.62	348.26	113.00	0.53	-0.11	40.218590	-104.749695	1,323,361.07	3,209,524.55
213.00	0.38	129.27	213.00	0.85	0.04	40.218591	-104.749694	1,323,361.39	3,209,524.70
313.00	0.65	243.89	312.99	0.39	-0.22	40.218590	-104.749695	1,323,360.93	3,209,524.45
413.00	0.43	18.93	412.99	0.50	-0.60	40.218590	-104.749696	1,323,361.03	3,209,524.06
513.00	0.67	196.46	512.99	0.29	-0.65	40.218590	-104.749697	1,323,360.83	3,209,524.02
613.00	0.39	343.25	612.99	0.05	-0.91	40.218589	-104.749698	1,323,360.59	3,209,523.76
713.00	0.50	171.54	712.99	-0.05	-0.95	40.218589	-104.749698	1,323,360.48	3,209,523.72
813.00	0.74	317.59	812.98	-0.01	-1.32	40.218589	-104.749699	1,323,360.53	3,209,523.35
913.00	0.29	193.27	912.98	0.22	-1.81	40.218590	-104.749701	1,323,360.75	3,209,522.86
1,013.00	0.47	0.09	1,012.98	0.39	-1.87	40.218590	-104.749701	1,323,360.92	3,209,522.80
1,113.00	0.60	230.30	1,112.98	0.46	-2.27	40.218590	-104.749702	1,323,360.99	3,209,522.40
1,176.00	0.77	286.60	1,175.98	0.37	-2.93	40.218590	-104.749705	1,323,360.89	3,209,521.74
1,239.90	0.24	252.95	1,239.87	0.46	-3.47	40.218590	-104.749707	1,323,360.97	3,209,521.20
1,283.00	0.29	155.81	1,282.97	0.33	-3.51	40.218590	-104.749707	1,323,360.85	3,209,521.16
1,378.00	0.84	139.73	1,377.97	-0.42	-2.96	40.218588	-104.749705	1,323,360.10	3,209,521.71
1,479.00	2.58	120.58	1,478.92	-2.14	-0.52	40.218583	-104.749696	1,323,358.40	3,209,524.16
1,566.00	3.43	114.51	1,565.80	-4.22	3.53	40.218577	-104.749682	1,323,356.36	3,209,528.23
1,660.00	5.74	110.76	1,659.49	-7.05	10.49	40.218570	-104.749657	1,323,353.58	3,209,535.21
1,754.00	7.14	113.30	1,752.90	-11.03	20.25	40.218559	-104.749622	1,323,349.69	3,209,545.01
1,848.00	9.54	115.62	1,845.90	-16.71	32.64	40.218543	-104.749577	1,323,344.11	3,209,557.45
1,942.00	12.62	108.93	1,938.14	-23.41	49.38	40.218525	-104.749517	1,323,337.56	3,209,574.24
2,037.00	13.94	109.11	2,030.59	-30.52	70.01	40.218505	-104.749444	1,323,330.62	3,209,594.93
2,131.00	15.28	106.62	2,121.55	-37.77	92.58	40.218485	-104.749363	1,323,323.56	3,209,617.56
2,225.00	16.85	109.37	2,211.88	-45.83	117.30	40.218463	-104.749274	1,323,315.71	3,209,642.35
2,319.00	18.36	110.83	2,301.48	-55.62	143.99	40.218436	-104.749179	1,323,306.15	3,209,669.12
2,413.00	18.07	110.76	2,390.77	-66.05	171.46	40.218408	-104.749080	1,323,295.95	3,209,696.68
2,508.00	18.18	110.14	2,481.05	-76.37	199.15	40.218379	-104.748981	1,323,285.86	3,209,724.45
2,602.00	20.94	111.53	2,569.62	-87.59	228.55	40.218349	-104.748876	1,323,274.90	3,209,753.94
2,696.00	20.70	110.92	2,657.48	-99.68	259.69	40.218315	-104.748764	1,323,263.06	3,209,785.19
2,790.00	21.34	111.04	2,745.23	-111.76	291.18	40.218282	-104.748652	1,323,251.26	3,209,816.77
2,884.00	21.56	111.00	2,832.72	-124.09	323.26	40.218248	-104.748537	1,323,239.20	3,209,848.96
2,979.00	21.77	111.54	2,921.00	-136.81	355.95	40.218213	-104.748420	1,323,226.75	3,209,881.74
3,074.00	21.92	112.54	3,009.18	-150.08	388.71	40.218177	-104.748302	1,323,213.77	3,209,914.62
3,169.00	19.98	110.72	3,097.90	-162.62	420.27	40.218143	-104.748189	1,323,201.49	3,209,946.28
3,264.00	19.93	110.11	3,187.20	-173.93	450.66	40.218112	-104.748081	1,323,190.44	3,209,976.76
3,359.00	18.64	109.05	3,276.86	-184.45	480.21	40.218083	-104.747975	1,323,180.17	3,210,006.40
3,454.00	16.31	107.50	3,367.47	-193.42	507.29	40.218058	-104.747878	1,323,171.43	3,210,033.56
3,549.00	17.09	106.37	3,458.47	-201.36	533.41	40.218036	-104.747784	1,323,163.71	3,210,059.74
3,644.00	17.35	107.42	3,549.21	-209.54	560.31	40.218014	-104.747688	1,323,155.76	3,210,086.71
3,740.00	18.20	110.77	3,640.63	-219.14	587.99	40.217987	-104.747589	1,323,146.40	3,210,114.47

Design Report for FERGE 28N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
3,835.00	18.81	112.29	3,730.71	-230.21	616.03	40.217957	-104.747488	1,323,135.56	3,210,142.60
3,930.00	16.74	109.17	3,821.18	-240.51	643.13	40.217929	-104.747391	1,323,125.49	3,210,169.78
4,025.00	18.11	113.25	3,911.82	-250.83	669.62	40.217900	-104.747297	1,323,115.39	3,210,196.36
4,120.00	20.58	114.69	4,001.45	-263.64	698.36	40.217865	-104.747194	1,323,102.83	3,210,225.21
4,215.00	21.08	114.47	4,090.24	-277.69	729.08	40.217827	-104.747084	1,323,089.04	3,210,256.04
4,310.00	20.40	114.62	4,179.08	-291.67	759.69	40.217788	-104.746974	1,323,075.33	3,210,286.76
4,405.00	18.47	114.72	4,268.66	-304.86	788.41	40.217752	-104.746871	1,323,062.38	3,210,315.60
4,500.00	18.71	115.05	4,358.71	-317.60	815.88	40.217717	-104.746773	1,323,049.87	3,210,343.17
4,596.00	19.35	112.77	4,449.46	-330.28	844.50	40.217682	-104.746670	1,323,037.44	3,210,371.89
4,691.00	18.60	112.30	4,539.30	-342.12	873.03	40.217650	-104.746568	1,323,025.84	3,210,400.52
4,786.00	18.67	113.60	4,629.32	-353.95	900.98	40.217617	-104.746468	1,323,014.24	3,210,428.57
4,880.00	18.70	114.42	4,718.37	-366.21	928.49	40.217584	-104.746370	1,323,002.22	3,210,456.18
4,975.00	18.12	115.21	4,808.50	-378.80	955.72	40.217549	-104.746272	1,322,989.86	3,210,483.52
5,070.00	17.15	115.74	4,899.04	-391.17	981.70	40.217515	-104.746179	1,322,977.71	3,210,509.60
5,165.00	15.78	116.53	4,990.14	-403.02	1,005.88	40.217483	-104.746092	1,322,966.06	3,210,533.88
5,260.00	15.20	117.44	5,081.69	-414.53	1,028.49	40.217451	-104.746012	1,322,954.74	3,210,556.58
5,355.00	14.95	113.02	5,173.42	-425.06	1,050.82	40.217422	-104.745932	1,322,944.40	3,210,579.00
5,450.00	14.08	112.75	5,265.39	-434.33	1,072.76	40.217397	-104.745853	1,322,935.33	3,210,601.01
5,545.00	12.89	113.40	5,357.77	-443.00	1,093.14	40.217373	-104.745780	1,322,926.82	3,210,621.47
5,640.00	11.50	110.24	5,450.62	-450.49	1,111.75	40.217352	-104.745713	1,322,919.50	3,210,640.14
5,735.00	8.83	108.22	5,544.12	-456.04	1,127.56	40.217337	-104.745657	1,322,914.07	3,210,656.00
5,831.00	7.44	104.13	5,639.16	-459.87	1,140.59	40.217327	-104.745610	1,322,910.36	3,210,669.06
5,926.00	4.68	101.18	5,733.62	-462.12	1,150.36	40.217320	-104.745575	1,322,908.19	3,210,678.85
6,021.00	3.34	72.65	5,828.39	-462.05	1,156.80	40.217321	-104.745552	1,322,908.32	3,210,685.29
6,116.00	0.94	58.79	5,923.32	-460.82	1,160.11	40.217324	-104.745540	1,322,909.58	3,210,688.59
6,211.00	0.50	34.37	6,018.31	-460.07	1,161.01	40.217326	-104.745537	1,322,910.33	3,210,689.48
6,306.00	0.30	22.40	6,113.31	-459.50	1,161.34	40.217328	-104.745536	1,322,910.91	3,210,689.80
6,401.00	0.14	327.34	6,208.31	-459.17	1,161.37	40.217329	-104.745536	1,322,911.23	3,210,689.83
6,497.00	0.28	337.66	6,304.31	-458.85	1,161.22	40.217329	-104.745536	1,322,911.55	3,210,689.68
6,592.00	0.20	76.49	6,399.31	-458.60	1,161.29	40.217330	-104.745536	1,322,911.80	3,210,689.75
6,687.00	0.25	41.14	6,494.31	-458.41	1,161.59	40.217331	-104.745535	1,322,912.00	3,210,690.05
6,735.00	2.13	2.75	6,542.29	-457.44	1,161.70	40.217333	-104.745535	1,322,912.97	3,210,690.15
6,781.00	5.19	358.37	6,588.19	-454.50	1,161.68	40.217341	-104.745535	1,322,915.90	3,210,690.11
6,829.00	10.11	358.87	6,635.75	-448.12	1,161.54	40.217359	-104.745535	1,322,922.29	3,210,689.91
6,877.00	13.45	358.03	6,682.74	-438.32	1,161.26	40.217386	-104.745536	1,322,932.08	3,210,689.55
6,925.00	16.88	358.93	6,729.06	-425.77	1,160.94	40.217420	-104.745537	1,322,944.63	3,210,689.12
6,972.00	21.51	358.92	6,773.43	-410.33	1,160.65	40.217463	-104.745538	1,322,960.07	3,210,688.70
7,020.00	25.68	0.59	6,817.41	-391.12	1,160.59	40.217515	-104.745538	1,322,979.27	3,210,688.48
7,067.00	30.34	1.99	6,858.89	-369.06	1,161.11	40.217576	-104.745537	1,323,001.34	3,210,688.81
7,115.00	34.48	1.59	6,899.41	-343.35	1,161.91	40.217646	-104.745534	1,323,027.05	3,210,689.39
7,162.00	39.33	0.30	6,936.98	-315.14	1,162.36	40.217724	-104.745532	1,323,055.26	3,210,689.60
7,210.00	44.69	359.40	6,972.63	-283.03	1,162.26	40.217812	-104.745533	1,323,087.37	3,210,689.23

Design Report for FERGE 28N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
7,257.00	49.47	1.29	7,004.63	-248.63	1,162.49	40.217906	-104.745532	1,323,121.77	3,210,689.17
7,305.00	53.84	2.12	7,034.40	-211.01	1,163.62	40.218010	-104.745528	1,323,159.40	3,210,689.98
7,352.00	59.10	1.45	7,060.36	-171.86	1,164.83	40.218117	-104.745523	1,323,198.55	3,210,690.86
7,400.00	63.36	1.56	7,083.45	-129.81	1,165.93	40.218233	-104.745519	1,323,240.61	3,210,691.61
7,447.00	66.18	0.55	7,103.48	-87.31	1,166.71	40.218349	-104.745517	1,323,283.12	3,210,692.03
7,495.00	71.54	0.59	7,120.79	-42.55	1,167.16	40.218472	-104.745515	1,323,327.87	3,210,692.10
7,542.00	77.01	0.93	7,133.52	2.67	1,167.76	40.218596	-104.745513	1,323,373.09	3,210,692.31
7,590.00	80.30	1.51	7,142.96	49.71	1,168.76	40.218725	-104.745509	1,323,420.14	3,210,692.92
7,625.00	84.44	1.49	7,147.61	84.38	1,169.67	40.218821	-104.745506	1,323,454.81	3,210,693.53
7,661.00	86.78	1.61	7,150.36	120.26	1,170.64	40.218919	-104.745502	1,323,490.70	3,210,694.20
7,682.00	88.15	1.68	7,151.29	141.23	1,171.24	40.218977	-104.745500	1,323,511.67	3,210,694.63
7,777.00	89.45	0.75	7,153.28	236.19	1,173.26	40.219237	-104.745493	1,323,606.64	3,210,695.84
7,872.00	90.56	1.21	7,153.27	331.17	1,174.88	40.219498	-104.745487	1,323,701.63	3,210,696.66
7,967.00	89.85	1.09	7,152.93	426.15	1,176.79	40.219759	-104.745480	1,323,796.61	3,210,697.76
8,062.00	91.20	1.11	7,152.06	521.13	1,178.61	40.220019	-104.745474	1,323,891.60	3,210,698.78
8,157.00	90.59	0.62	7,150.58	616.10	1,180.05	40.220280	-104.745469	1,323,986.58	3,210,699.41
8,252.00	88.80	359.48	7,151.09	711.10	1,180.13	40.220541	-104.745468	1,324,081.57	3,210,698.69
8,347.00	91.08	1.12	7,151.19	806.08	1,180.63	40.220802	-104.745467	1,324,176.55	3,210,698.38
8,442.00	89.45	0.77	7,150.75	901.07	1,182.19	40.221062	-104.745461	1,324,271.54	3,210,699.15
8,538.00	90.59	1.66	7,150.71	997.04	1,184.23	40.221326	-104.745454	1,324,367.53	3,210,700.37
8,633.00	92.13	2.12	7,148.46	1,091.96	1,187.36	40.221586	-104.745442	1,324,462.46	3,210,702.70
8,728.00	92.28	0.44	7,144.80	1,186.86	1,189.48	40.221847	-104.745435	1,324,557.38	3,210,704.02
8,823.00	92.62	1.73	7,140.74	1,281.76	1,191.28	40.222107	-104.745428	1,324,652.28	3,210,705.01
8,918.00	91.75	1.69	7,137.12	1,376.65	1,194.11	40.222368	-104.745418	1,324,747.18	3,210,707.04
9,013.00	89.97	2.17	7,135.69	1,471.58	1,197.31	40.222628	-104.745407	1,324,842.13	3,210,709.43
9,108.00	90.31	1.21	7,135.46	1,566.53	1,200.11	40.222889	-104.745397	1,324,937.11	3,210,711.43
9,204.00	88.18	1.19	7,136.73	1,662.50	1,202.12	40.223152	-104.745389	1,325,033.08	3,210,712.63
9,299.00	88.27	0.15	7,139.67	1,757.45	1,203.23	40.223413	-104.745385	1,325,128.03	3,210,712.94
9,394.00	89.60	0.54	7,141.43	1,852.43	1,203.81	40.223674	-104.745383	1,325,223.01	3,210,712.71
9,489.00	90.68	3.01	7,141.20	1,947.37	1,206.75	40.223934	-104.745373	1,325,317.97	3,210,714.84
9,584.00	90.74	1.87	7,140.02	2,042.28	1,210.79	40.224195	-104.745358	1,325,412.90	3,210,718.09
9,679.00	89.32	2.36	7,139.98	2,137.21	1,214.30	40.224456	-104.745346	1,325,507.86	3,210,720.79
9,774.00	88.80	1.47	7,141.53	2,232.14	1,217.47	40.224716	-104.745334	1,325,602.81	3,210,723.16
9,870.00	90.37	1.32	7,142.23	2,328.11	1,219.81	40.224980	-104.745326	1,325,698.79	3,210,724.68
9,965.00	91.08	0.71	7,141.03	2,423.08	1,221.49	40.225240	-104.745320	1,325,793.77	3,210,725.56
10,060.00	91.48	1.98	7,138.90	2,518.03	1,223.72	40.225501	-104.745312	1,325,888.73	3,210,726.99
10,165.00	90.68	359.59	7,136.93	2,622.99	1,225.16	40.225789	-104.745307	1,325,993.70	3,210,727.54
10,250.00	91.88	2.46	7,135.03	2,707.95	1,226.68	40.226022	-104.745301	1,326,078.66	3,210,728.34
10,345.00	91.39	3.11	7,132.32	2,802.80	1,231.29	40.226283	-104.745285	1,326,173.54	3,210,732.15
10,440.00	90.99	2.10	7,130.34	2,897.68	1,235.61	40.226543	-104.745269	1,326,268.45	3,210,735.66
10,536.00	89.26	0.69	7,130.13	2,993.64	1,237.95	40.226806	-104.745261	1,326,364.42	3,210,737.19
10,631.00	89.97	1.78	7,130.77	3,088.62	1,239.99	40.227067	-104.745254	1,326,459.41	3,210,738.43

Design Report for FERGE 28N-14HZ - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
10,726.00	90.49	4.42	7,130.39	3,183.47	1,245.13	40.227328	-104.745235	1,326,554.29	3,210,742.77
10,821.00	90.46	4.67	7,129.60	3,278.17	1,252.66	40.227587	-104.745208	1,326,649.05	3,210,749.49
10,916.00	90.28	3.12	7,128.99	3,372.94	1,259.11	40.227848	-104.745185	1,326,743.87	3,210,755.14
11,011.00	90.09	1.92	7,128.68	3,467.85	1,263.29	40.228108	-104.745170	1,326,838.81	3,210,758.52
11,106.00	90.22	1.33	7,128.43	3,562.81	1,265.98	40.228369	-104.745160	1,326,933.78	3,210,760.41
11,202.00	90.37	1.70	7,127.93	3,658.77	1,268.52	40.228632	-104.745151	1,327,029.76	3,210,762.13
11,297.00	89.97	359.50	7,127.65	3,753.76	1,269.51	40.228893	-104.745148	1,327,124.75	3,210,762.32
11,392.00	90.28	359.80	7,127.44	3,848.76	1,268.93	40.229154	-104.745150	1,327,219.74	3,210,760.94
11,487.00	89.60	359.27	7,127.54	3,943.76	1,268.16	40.229415	-104.745153	1,327,314.72	3,210,759.36
11,582.00	89.97	3.17	7,127.90	4,038.72	1,270.19	40.229675	-104.745145	1,327,409.69	3,210,760.58
11,677.00	90.43	3.66	7,127.57	4,133.55	1,275.84	40.229935	-104.745125	1,327,504.56	3,210,765.44
11,772.00	90.19	2.31	7,127.05	4,228.41	1,280.79	40.230196	-104.745107	1,327,599.46	3,210,769.58
11,867.00	90.43	2.21	7,126.54	4,323.34	1,284.54	40.230456	-104.745094	1,327,694.41	3,210,772.53
11,962.00	89.82	1.20	7,126.33	4,418.29	1,287.36	40.230717	-104.745084	1,327,789.38	3,210,774.55
12,057.00	89.75	0.95	7,126.69	4,513.28	1,289.15	40.230978	-104.745077	1,327,884.37	3,210,775.53
12,152.00	90.22	0.92	7,126.71	4,608.26	1,290.70	40.231239	-104.745072	1,327,979.36	3,210,776.27
12,247.00	89.91	359.21	7,126.60	4,703.26	1,290.80	40.231499	-104.745071	1,328,074.35	3,210,775.58
12,342.00	89.60	357.54	7,127.01	4,798.22	1,288.11	40.231760	-104.745081	1,328,169.28	3,210,772.08
12,437.00	89.66	356.75	7,127.62	4,893.10	1,283.38	40.232020	-104.745098	1,328,264.11	3,210,766.55
12,469.00	89.57	355.48	7,127.84	4,925.02	1,281.21	40.232108	-104.745106	1,328,296.02	3,210,764.11
12,518.00	89.57	355.48	7,128.21	4,973.87	1,277.35	40.232242	-104.745119	1,328,344.83	3,210,759.83

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,176.00	1,175.98	0.37	-2.93	Tie-On to Gyros @ 1176.00ft
1,283.00	1,282.97	0.33	-3.51	First MWD Survey @ 1283.00ft
12,469.00	7,127.84	4,925.02	1,281.21	Final MWD Survey @ 12469.00ft
12,518.00	7,128.21	4,973.87	1,277.35	Str Line Proj to Bit @ 12518' MD :: 7128.21' 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)	1.92	Slot	0.00	0.00	0.00

Design Report for FERGE 28N-14HZ - Actual Field Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
13.00	1,176.00	MS Energy Gyro Surveys	NS-GYRO-MS
1,283.00	7,625.00	MWD Vertical/Build Surveys	MWD+IFR1+SC
7,682.00	12,469.00	MWD Lateral Surveys	MWD+IFR1+SC

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,239.90	1,239.87	9 5/8" Casing Set @ 1239' MD :: 1239.87' TVD	9-5/8	13-1/2
7,661.00	7,150.36	7" Casing Set @ 7661' MD :: 7150.36' TVD	7	8-3/4

Design Targets

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

Directional Difficulty Index

Average Dogleg over Survey:	1.92 °/100usft	Maximum Dogleg over Survey:	11.83 °/100usft at 7,625.00 usft
Net Tortousity applicable to Plans:	0.80 °/100usft	Directional Difficulty Index:	6.450

Audit Info

North Reference Sheet for Sec. 14-T3N-R66W - FERGE 28N-14HZ - Plan C

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

Vertical Depths are relative to RKB = 13' @ 4926.00usft (Ensign 132). Northing and Easting are relative to FERGE 28N-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: 0.99995700

Grid Coordinates of Well: 1,323,360.54 usft N, 3,209,524.67 usft E

Geographical Coordinates of Well: 40° 13' 06.92" N, 104° 44' 58.90" W

Grid Convergence at Surface is: 0.48°

Based upon Minimum Curvature type calculations, at a Measured Depth of 12,518.00usft

the Bottom Hole Displacement is 5,135.27usft in the Direction of 14.40° (True).

Magnetic Convergence at surface is: -8.02° (24 April 2014, , BGGM2013)