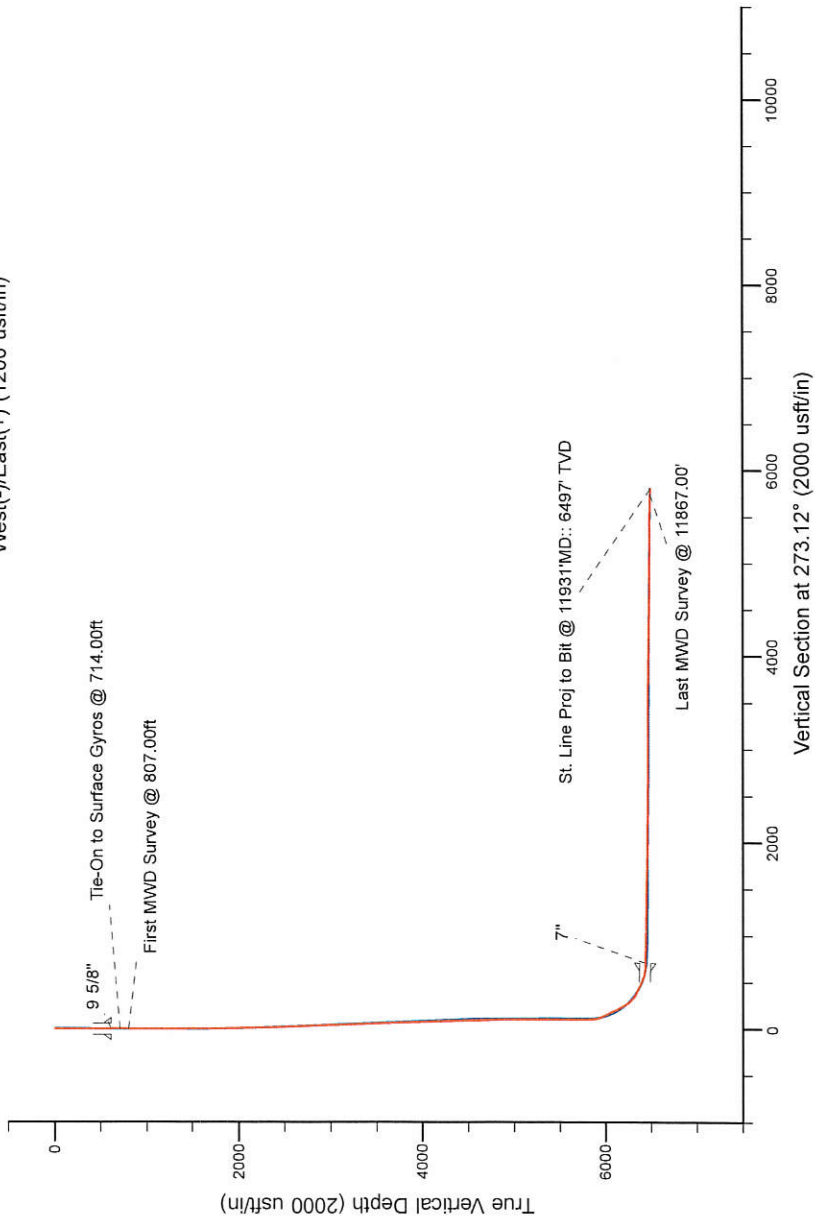
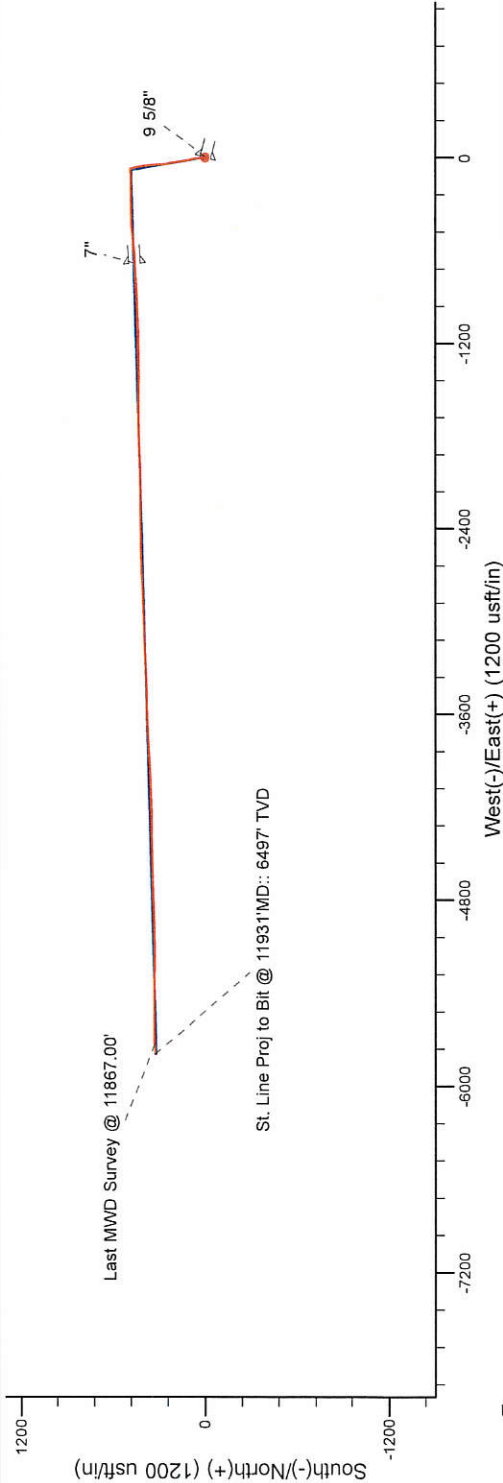


Project: Weld County, CO (NAD 83)
Site: Sec. 29-T6N-R62W (Wells Ranch AE32-30-A Pad)
Well: Wells Ranch AE30-63-1BHNA
Wellbore: Plan C
Design: Field Surveys

Noble Energy



LEGEND

- Wells Ranch AE30-63-1BHNA, Plan C, Rev C0 - PROPOSAL V0
- Field Surveys

Plated SHL: 342' FSL, 65' FWL
Plated Lat/Long: 40.451350 N, 104.356270 W
Location: Sec.29-T6N-R62W

7\" Casing: ~ 821' FSL, ~ 622' FEL
Lat/Long: 40.452631 N, 104.358709 W
State Planes - CO Northern: 1,409,777.86' N, 3,317,605.77' E
Location: Sec. 30-T6N-R62W

BHL: ~ 833' FSL, ~ 383' FEL
Lat/Long: 40.452441 N, 104.377079 W
State Planes - CO Northern: 1,409,643.15' N, 3,312,494.92' E
Location: Sec. 25-T6N-R63W

WELL DETAILS: Wells Ranch AE30-63-1BHNA

Ground Level: 4749.00
RKB=24 @ 4773.00usft (H&P 343)

Created By: Pari Amanlou
Created On: 17:35, June 16 2014

Noble Energy

Weld County, CO (NAD 83)

Sec. 29-T6N-R62W (Wells Ranch AE32-30-A Pad)

Wells Ranch AE30-63-1BHNA

901136505

Plan C

Final Surveys

Sperry Drilling Services

Final Survey Report

18 June, 2014

Well Coordinates: 1,409,319.82 N, 3,318,290.54 E (40° 27' 04.86" N, 104° 21' 22.57" W)

Ground Level: 4,749.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Wells Ranch AE30-63-1BHNA

RKB=24 @ 4773.00usft (H&P 343)

N

Grid

Dec-Deg - API - US Survey Feet - Custom

HALLIBURTON

Design Report for Wells Ranch AE30-63-1BHNA - Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Wells Ranch AE30-63-1BHNA_SHL - Wells Ranch AE30-63-1BHNA_SL - Wells Ranch AE30-63-1BHNA_460 1 - Wells Ranch AE30-63-1BHNA_460 2										
365.00	0.20	136.55	365.00	-0.46	0.44	-0.46	0.05	0.05	0.00	136.55
615.00	0.40	285.35	615.00	-0.55	-0.10	0.07	0.23	0.08	59.52	159.08
616.00	0.40	285.41	616.00	-0.55	-0.11	0.08	0.31	-0.31	6.03	172.38
9 5/8"										
714.00	0.10	309.78	714.00	-0.40	-0.50	0.48	0.31	-0.30	24.87	172.32
Tie-On to Surface Gyros @ 714.00ft										
807.00	0.12	269.19	807.00	-0.35	-0.66	0.64	0.08	0.02	-43.65	-96.48
First MWD Survey @ 807.00ft										
899.00	0.03	262.47	899.00	-0.36	-0.78	0.76	0.10	-0.10	-7.30	-177.77
991.00	0.19	290.71	991.00	-0.30	-0.95	0.93	0.18	0.17	30.70	33.20
1,176.00	0.13	255.03	1,176.00	-0.25	-1.44	1.42	0.06	-0.03	-19.29	-138.06
1,362.00	0.16	298.62	1,361.99	-0.18	-1.87	1.86	0.06	0.02	23.44	97.29
1,456.00	0.26	285.08	1,455.99	-0.06	-2.19	2.19	0.12	0.11	-14.40	-33.27
1,549.00	0.25	306.84	1,548.99	0.11	-2.56	2.56	0.10	-0.01	23.40	106.70
1,642.00	2.10	358.36	1,641.97	1.94	-2.77	2.87	2.10	1.99	55.40	57.26
1,736.00	3.99	357.04	1,735.83	6.93	-2.99	3.36	2.01	2.01	-1.40	-2.78
1,830.00	5.21	354.80	1,829.53	14.44	-3.54	4.32	1.31	1.30	-2.38	-9.49
1,925.00	6.67	354.25	1,924.02	24.23	-4.49	5.80	1.54	1.54	-0.58	-2.51
2,020.00	8.53	355.78	2,018.18	36.75	-5.56	7.55	1.97	1.96	1.61	6.97
2,115.00	8.92	354.77	2,112.08	51.11	-6.75	9.52	0.44	0.41	-1.06	-21.95
2,209.00	9.56	351.33	2,204.86	66.08	-8.59	12.17	0.90	0.68	-3.66	-42.50
2,304.00	8.56	352.70	2,298.67	80.89	-10.68	15.06	1.08	-1.05	1.44	168.50
2,398.00	8.52	349.85	2,391.63	94.69	-12.79	17.92	0.45	-0.04	-3.03	-96.81
2,493.00	7.51	347.74	2,485.70	107.68	-15.35	21.19	1.11	-1.06	-2.22	-164.80
2,587.00	8.48	351.68	2,578.79	120.54	-17.66	24.19	1.18	1.03	4.19	31.43
2,681.00	9.85	349.95	2,671.59	135.32	-20.06	27.40	1.49	1.46	-1.84	-12.23
2,775.00	10.84	352.60	2,764.06	152.00	-22.61	30.84	1.17	1.05	2.82	26.98
2,869.00	10.56	349.98	2,856.42	169.25	-25.24	34.41	0.60	-0.30	-2.79	-121.21
2,963.00	10.96	348.99	2,948.77	186.50	-28.45	38.55	0.47	0.43	-1.05	-25.29
3,058.00	9.54	348.31	3,042.25	203.08	-31.77	42.77	1.50	-1.49	-0.72	-175.46
3,152.00	9.99	348.97	3,134.89	218.71	-34.91	46.75	0.49	0.48	0.70	14.29
3,247.00	8.20	343.80	3,228.69	233.30	-38.37	51.01	2.07	-1.88	-5.44	-158.00
3,342.00	8.24	346.38	3,322.72	246.42	-41.87	55.21	0.39	0.04	2.72	85.09
3,437.00	8.75	351.16	3,416.68	260.18	-44.58	58.67	0.92	0.54	5.03	56.54
3,532.00	10.25	356.40	3,510.37	275.76	-46.22	61.16	1.82	1.58	5.52	32.57
3,627.00	12.39	357.19	3,603.52	294.38	-47.25	63.20	2.26	2.25	0.83	4.53
3,722.00	13.57	358.05	3,696.09	315.69	-48.13	65.23	1.26	1.24	0.91	9.72
3,817.00	14.44	357.73	3,788.27	338.67	-48.98	67.33	0.92	0.92	-0.34	-5.24
3,912.00	12.60	353.63	3,880.63	360.80	-50.60	70.15	2.18	-1.94	-4.32	-154.47
4,007.00	10.56	351.43	3,973.69	379.71	-53.05	73.62	2.20	-2.15	-2.32	-168.86
4,102.00	9.50	352.79	4,067.24	396.10	-55.33	76.79	1.14	-1.12	1.43	168.07
4,197.00	7.75	352.88	4,161.16	410.23	-57.11	79.34	1.84	-1.84	0.09	179.60
4,292.00	6.46	351.13	4,255.43	421.87	-58.72	81.59	1.38	-1.36	-1.84	-171.34
4,386.00	7.44	348.98	4,348.74	433.07	-60.70	84.17	1.08	1.04	-2.29	-15.94
4,481.00	6.47	347.58	4,443.04	444.33	-63.03	87.11	1.04	-1.02	-1.47	-170.78
4,576.00	5.00	345.89	4,537.56	453.58	-65.19	89.77	1.56	-1.55	-1.78	-174.29
4,671.00	4.38	344.28	4,632.24	461.08	-67.18	92.17	0.67	-0.65	-1.69	-168.81
4,766.00	4.10	341.72	4,726.98	467.80	-69.23	94.58	0.36	-0.29	-2.69	-147.21
4,860.00	3.64	337.87	4,820.77	473.76	-71.41	97.07	0.56	-0.49	-4.10	-152.45
4,955.00	3.43	337.37	4,915.59	479.17	-73.64	99.60	0.22	-0.22	-0.53	-171.90
5,049.00	1.55	1.16	5,009.50	483.04	-74.69	100.86	2.24	-2.00	25.31	162.73
5,144.00	0.65	49.35	5,104.48	484.67	-74.26	100.52	1.28	-0.95	50.73	156.54
5,239.00	0.25	61.17	5,199.48	485.13	-73.67	99.95	0.43	-0.42	12.44	172.80
5,334.00	0.52	272.52	5,294.47	485.24	-73.92	100.21	0.78	0.28	-156.47	-158.70
5,429.00	0.57	269.27	5,389.47	485.26	-74.82	101.11	0.06	0.05	-3.42	-33.36
5,524.00	0.33	22.55	5,484.47	485.50	-75.19	101.49	0.80	-0.25	119.24	156.60

Design Report for Wells Ranch AE30-63-1BHNA - Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
5,619.00	0.36	45.32	5,579.47	485.97	-74.87	101.20	0.15	0.03	23.97	89.20
5,714.00	0.45	72.29	5,674.46	486.29	-74.30	100.65	0.22	0.09	28.39	78.62
5,807.00	0.71	89.75	5,767.46	486.40	-73.38	99.73	0.33	0.28	18.77	43.14
5,902.00	5.06	259.19	5,862.35	485.62	-76.91	103.21	6.06	4.58	178.36	170.73
5,996.00	24.29	269.63	5,952.87	484.71	-100.54	126.76	20.57	20.46	11.11	13.01
6,091.00	26.10	267.99	6,038.83	483.85	-140.97	167.08	2.04	1.91	-1.73	-21.84
6,186.00	24.44	268.21	6,124.73	482.50	-181.50	207.48	1.75	-1.75	0.23	176.86
6,281.00	29.85	271.58	6,209.24	482.54	-224.81	250.72	5.92	5.69	3.55	17.38
6,376.00	45.16	269.73	6,284.39	483.04	-282.47	308.33	16.16	16.12	-1.95	-4.96
6,471.00	63.53	266.95	6,339.53	480.59	-359.28	384.89	19.48	19.34	-2.93	-7.86
6,566.00	64.37	266.82	6,381.25	475.96	-444.50	469.73	0.89	0.88	-0.14	-7.94
6,660.00	71.64	264.63	6,416.44	469.42	-531.35	556.10	8.03	7.73	-2.33	-16.03
6,755.00	85.74	266.04	6,435.02	461.89	-623.96	648.16	14.91	14.84	1.48	5.75
6,772.00	88.40	266.53	6,435.89	460.79	-640.90	665.02	15.91	15.65	2.88	10.44
6,816.00	88.59	266.35	6,437.05	458.06	-684.80	708.70	0.59	0.42	-0.42	-44.61
7"										
6,947.00	89.14	265.80	6,439.65	449.09	-815.46	838.69	0.59	0.42	-0.42	-44.61
7,040.00	90.25	267.93	6,440.14	444.01	-908.32	931.13	2.58	1.19	2.29	62.48
7,132.00	87.60	268.26	6,441.87	440.95	-1,000.24	1,022.75	2.90	-2.88	0.36	172.91
7,225.00	88.21	268.47	6,445.27	438.30	-1,093.14	1,115.37	0.69	0.66	0.23	18.99
7,319.00	88.64	269.33	6,447.85	436.49	-1,187.09	1,209.08	1.02	0.46	0.91	63.44
7,412.00	90.59	269.29	6,448.48	435.37	-1,280.07	1,301.86	2.10	2.10	-0.04	-1.18
7,505.00	90.34	270.16	6,447.72	434.93	-1,373.07	1,394.70	0.97	-0.27	0.94	106.03
7,599.00	88.09	270.63	6,449.01	435.57	-1,467.05	1,488.57	2.45	-2.39	0.50	168.20
7,693.00	87.87	270.54	6,452.32	436.53	-1,560.99	1,582.42	0.25	-0.23	-0.10	-157.77
7,788.00	87.47	268.68	6,456.18	435.89	-1,655.90	1,677.16	2.00	-0.42	-1.96	-102.18
7,883.00	88.31	268.33	6,459.68	433.41	-1,750.81	1,771.79	0.96	0.88	-0.37	-22.61
7,977.00	89.05	267.76	6,461.85	430.20	-1,844.72	1,865.40	0.99	0.79	-0.61	-37.61
8,072.00	90.18	267.61	6,462.49	426.37	-1,939.64	1,959.97	1.20	1.19	-0.16	-7.56
8,167.00	90.06	268.96	6,462.29	423.52	-2,034.60	2,054.63	1.43	-0.13	1.42	95.08
8,262.00	89.69	270.41	6,462.49	423.00	-2,129.59	2,149.45	1.58	-0.39	1.53	104.32
8,357.00	88.95	269.90	6,463.62	423.26	-2,224.59	2,244.32	0.95	-0.78	-0.54	-145.43
8,452.00	89.01	268.87	6,465.31	422.24	-2,319.56	2,339.10	1.09	0.06	-1.08	-86.67
8,546.00	89.54	268.32	6,466.50	419.93	-2,413.53	2,432.80	0.81	0.56	-0.59	-46.06
8,642.00	90.40	269.02	6,466.55	417.71	-2,509.50	2,528.51	1.16	0.90	0.73	39.14
8,736.00	90.12	269.10	6,466.13	416.16	-2,603.49	2,622.27	0.31	-0.30	0.09	164.05
8,831.00	89.05	266.49	6,466.81	412.51	-2,698.40	2,716.85	2.97	-1.13	-2.75	-112.30
8,926.00	89.72	265.84	6,467.83	406.16	-2,793.19	2,811.14	0.98	0.71	-0.68	-44.13
9,021.00	90.03	268.87	6,468.04	401.77	-2,888.07	2,905.65	3.21	0.33	3.19	84.16
9,115.00	89.88	268.93	6,468.12	399.97	-2,982.06	2,999.40	0.17	-0.16	0.06	158.20
9,210.00	89.78	267.64	6,468.40	397.13	-3,077.01	3,094.06	1.36	-0.11	-1.36	-94.43
9,305.00	90.18	267.32	6,468.43	392.95	-3,171.92	3,188.60	0.54	0.42	-0.34	-38.66
9,400.00	90.74	266.13	6,467.67	387.52	-3,266.76	3,283.00	1.38	0.59	-1.25	-64.79
9,495.00	91.85	268.54	6,465.52	383.11	-3,361.62	3,377.49	2.79	1.17	2.54	65.24
9,589.00	88.49	267.87	6,465.24	380.16	-3,455.56	3,471.13	3.64	-3.57	-0.71	-168.72
9,684.00	89.14	268.09	6,467.21	376.81	-3,550.48	3,565.72	0.72	0.68	0.23	18.70
9,779.00	90.09	269.38	6,467.84	374.72	-3,645.45	3,660.44	1.69	1.00	1.36	53.64
9,873.00	87.72	266.47	6,469.64	371.31	-3,739.36	3,754.02	3.99	-2.52	-3.10	-129.19
9,968.00	88.61	266.55	6,472.68	365.53	-3,834.13	3,848.34	0.94	0.94	0.08	5.14
10,062.00	89.78	267.11	6,474.00	360.34	-3,927.98	3,941.76	1.38	1.24	0.60	25.58
10,157.00	88.00	267.68	6,475.84	356.02	-4,022.86	4,036.27	1.97	-1.87	0.60	162.25
10,252.00	88.95	267.99	6,478.37	352.43	-4,117.75	4,130.83	1.05	1.00	0.33	18.07
10,347.00	91.23	268.22	6,478.22	349.29	-4,212.70	4,225.46	2.41	2.40	0.24	5.76
10,442.00	89.63	268.91	6,477.51	346.91	-4,307.66	4,320.15	1.83	-1.68	0.73	156.67
10,537.00	87.29	268.50	6,480.06	344.77	-4,402.59	4,414.83	2.50	-2.46	-0.43	-170.07
10,631.00	88.55	268.56	6,483.47	342.36	-4,496.50	4,508.47	1.34	1.34	0.06	2.73
10,726.00	90.83	269.00	6,483.99	340.33	-4,591.47	4,603.19	2.44	2.40	0.46	10.92
10,821.00	89.08	268.95	6,484.06	338.64	-4,686.45	4,697.93	1.84	-1.84	-0.05	-178.36
10,916.00	88.06	268.38	6,486.43	336.42	-4,781.39	4,792.62	1.23	-1.07	-0.60	-150.82

Design Report for Wells Ranch AE30-63-1BHNA - Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	Toolface Azimuth (°)
11,010.00	89.17	268.26	6,488.71	333.67	-4,875.32	4,886.26	1.19	1.18	-0.13	-6.17
11,105.00	90.62	267.82	6,488.88	330.42	-4,970.27	4,980.88	1.60	1.53	-0.46	-16.88
11,200.00	90.34	268.63	6,488.08	327.48	-5,065.22	5,075.53	0.90	-0.29	0.85	109.07
11,294.00	89.38	269.74	6,488.31	326.14	-5,159.20	5,169.31	1.56	-1.02	1.18	130.86
11,389.00	91.29	271.54	6,487.76	327.20	-5,254.19	5,264.21	2.76	2.01	1.89	43.30
11,484.00	90.43	270.55	6,486.33	328.93	-5,349.16	5,359.13	1.38	-0.91	-1.04	-130.98
11,578.00	89.26	270.88	6,486.59	330.11	-5,443.15	5,453.05	1.29	-1.24	0.35	164.25
11,673.00	88.06	270.10	6,488.81	330.92	-5,538.12	5,547.92	1.51	-1.26	-0.82	-146.99
11,768.00	88.06	268.56	6,492.02	329.81	-5,633.05	5,642.65	1.62	0.00	-1.62	-90.03
11,863.00	88.21	267.39	6,495.12	326.45	-5,727.94	5,737.22	1.24	0.16	-1.23	-82.71
11,867.00	88.24	267.38	6,495.24	326.27	-5,731.94	5,741.20	0.79	0.75	-0.25	-18.43
Last MWD Survey @ 11867.00'										
11,931.00	88.24	267.38	6,497.21	323.35	-5,795.84	5,804.85	0.00	0.00	0.00	1.53
St. Line Proj to Bit @ 11931'MD:: 6497' TVD - Wells Ranch AE30-63-1BHNA_BHL										

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
714.00	714.00	-0.40	-0.50	Tie-On to Surface Gyros @ 714.00ft
807.00	807.00	-0.35	-0.66	First MWD Survey @ 807.00ft
11,867.00	6,495.24	326.27	-5,731.94	Last MWD Survey @ 11867.00'
11,931.00	6,497.21	323.35	-5,795.84	St. Line Proj to Bit @ 11931'MD:: 6497' TVD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/-S (usft)	+E/-W (usft)	
Target	Wells Ranch AE30-63-1BHNA_BHL	273.12	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
365.00	615.00	Surface Gyros	Flexi-Shot
714.00	6772.00	MWD Surveys - Intermediate	MWD+IFR1+MS_WY
6947.00	11,867.00	MWD Surveys - Production	MWD+IFR1+MS_WY

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
616.00	616.00	9 5/8"	9-5/8	13-3/4
6,816.00	6,437.05	7"	7	8-3/4

Design Report for Wells Ranch AE30-63-1BHNA - Field Surveys

Targets associated with this wellbore

Target Name	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Shape
Wells Ranch AE30-63-1BHNA_SL	0.00	0.00	0.00	Polygon
Wells Ranch AE30-63-1BHNA_SHL	0.00	0.00	0.00	Point
Wells Ranch AE30-63-1BHNA_460 1	0.00	0.00	0.00	Polygon
Wells Ranch AE30-63-1BHNA_460 2	0.00	0.00	0.00	Polygon
Wells Ranch AE30-63-1BHNA_BHL	6,490.47	315.78	-5,796.09	Point

Directional Difficulty Index

Average Dogleg over Survey:	1.86 °/100usft	Maximum Dogleg over Survey:	20.57 °/100usft at 5,996.00 usft
Net Tortousity applicable to Plans:	0.94 °/100usft	Directional Difficulty Index:	6.405

Audit Info

North Reference Sheet for Sec. 29-T6N-R62W (Wells Ranch AE32-30-A Pad) - Wells Ranch AE30-63-1BHNA - Plan C

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

Vertical Depths are relative to RKB=24 @ 4773.00usft (H&P 343). Northing and Easting are relative to Wells Ranch AE 30-63-1BHNA

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 -105.50°, Longitude Origin:0.000000°, Latitude Origin:40.783333°

False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99996296

Grid Coordinates of Well: 1,409,319.82 usft N, 3,318,290.54 usft E

Geographical Coordinates of Well: 40° 27' 04.86" N, 104° 21' 22.57" W

Grid Convergence at Surface is: 0.74°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,931.00usft
the Bottom Hole Displacement is 5,804.85usft in the Direction of 273.19° (Grid).

Magnetic Convergence at surface is: -7.55° (2 June 2014, , BGGM2013)

