



Project: WELD COUNTY (NAD 83)
Site: SE SW SEC. 13 T1N R67W 6th P.M.
Well: QUARTER CIRCLE 24-8HZ
Wellbore: JOB #2018-308-461
Design: FINAL SURVEYS

ANNOTATIONS

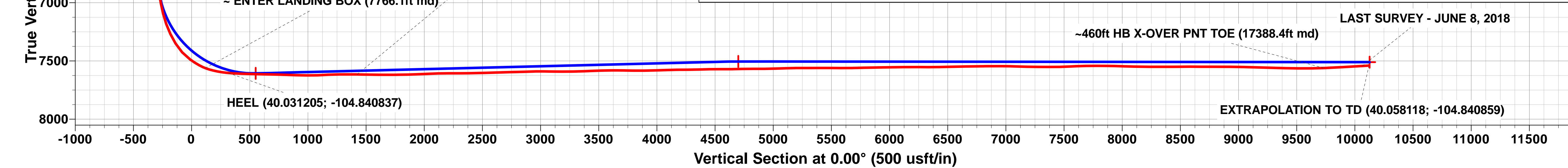
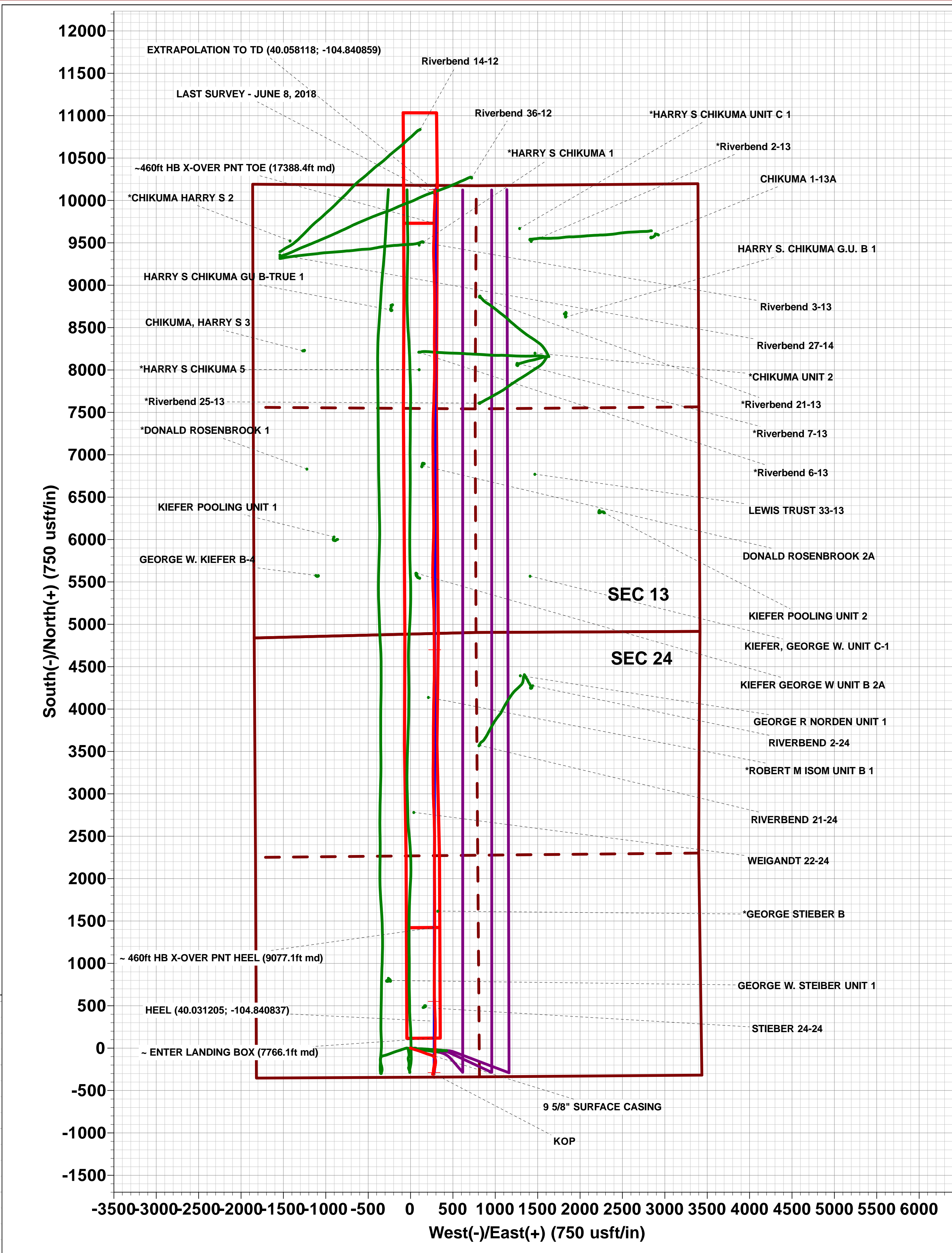
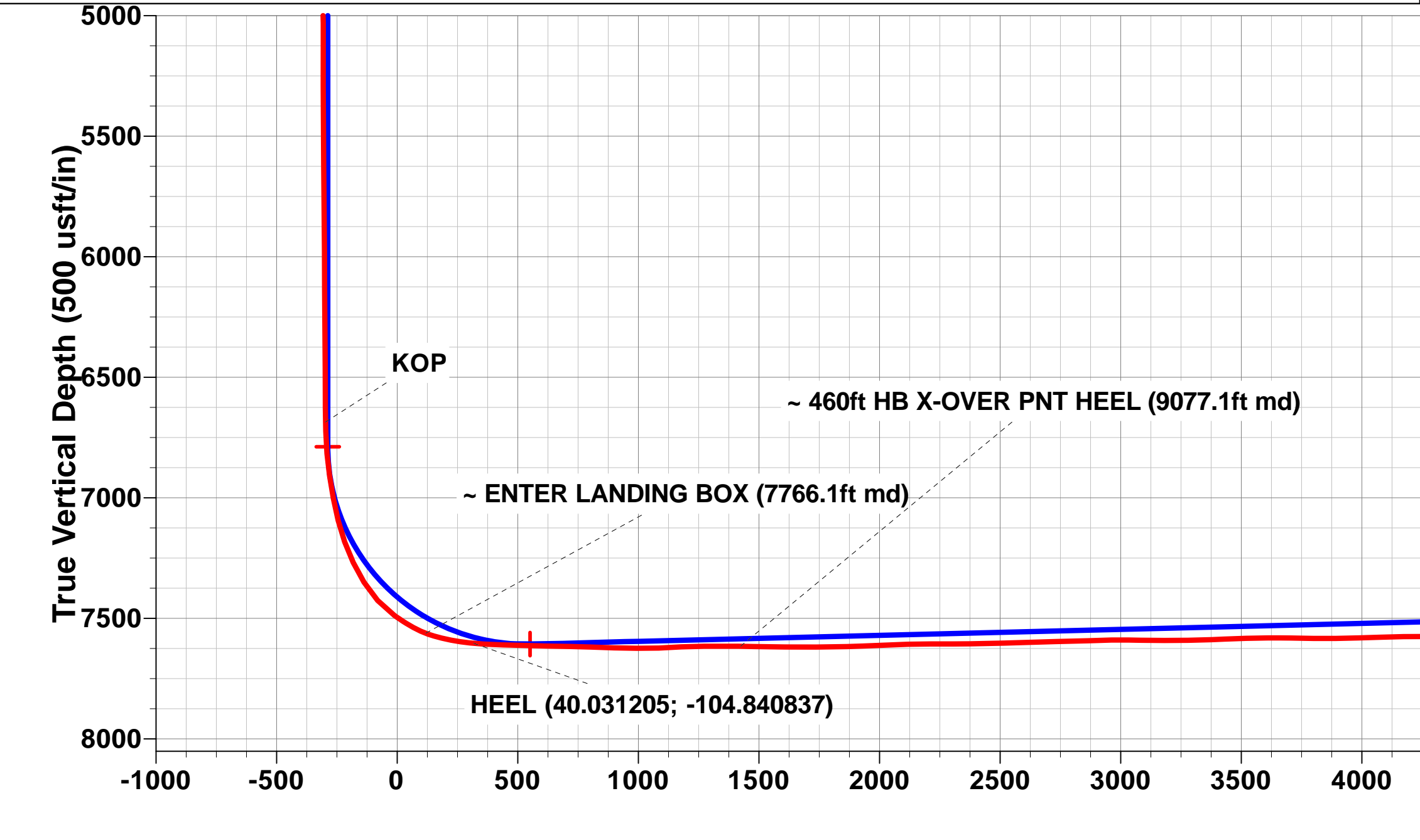
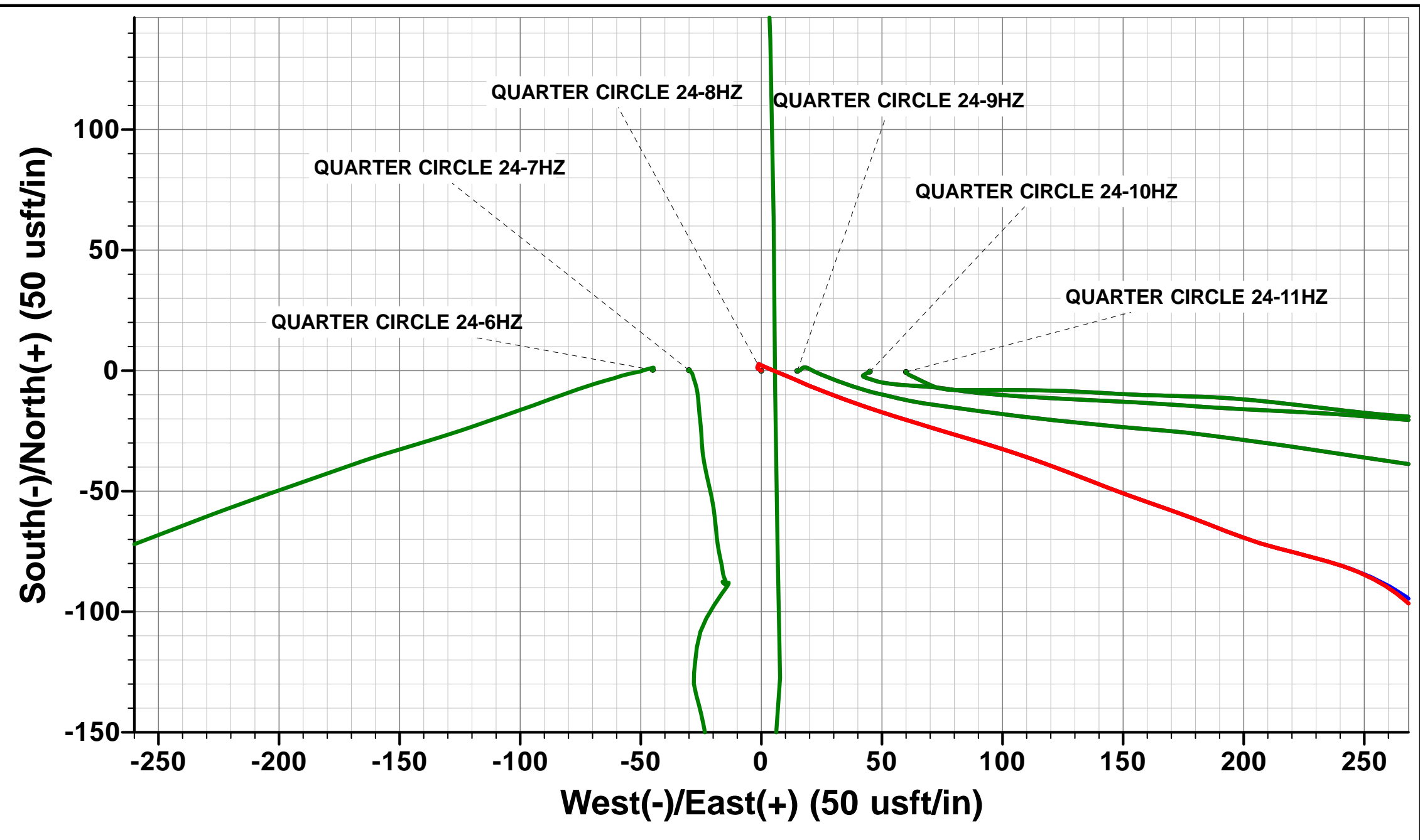
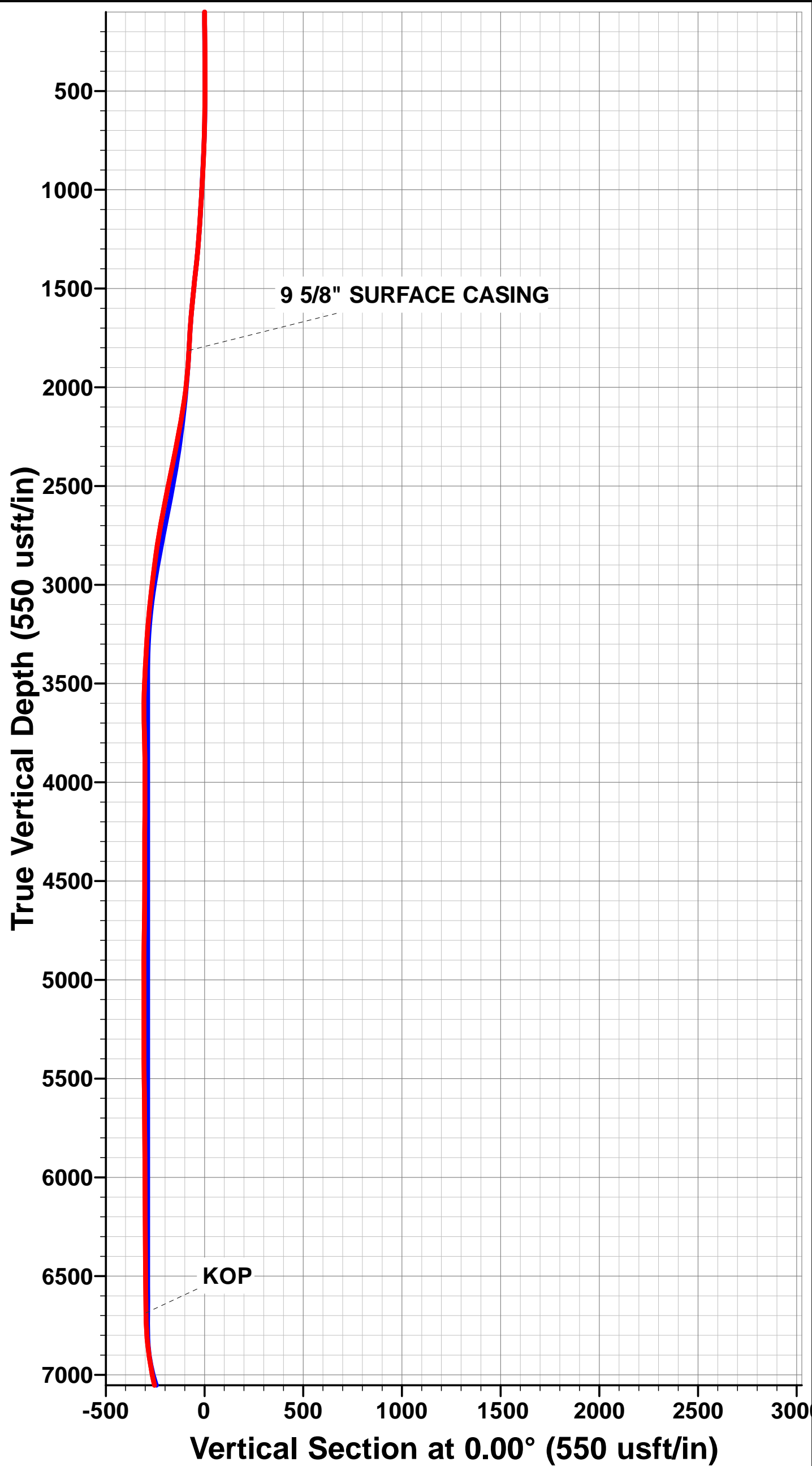
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
1813.5	1842.0	11.40	105.08	-78.9	234.0	-78.9	253.1	9 5/8" SURFACE CASING
6686.5	6737.0	1.01	11.75	-297.4	268.0	-297.4	551.1	KOP
7562.3	7766.1	68.85	2.34	118.0	288.4	118.0	968.8	~ ENTER LANDING BOX (7766.1ft md)
7604.0	7970.0	85.10	358.46	316.9	291.6	316.9	1167.0	HEEL (40.031205; -104.840837)
7616.1	9077.1	89.49	0.18	1423.3	285.6	1423.3	2273.4	~ 460ft HB X-OVER PNT HEEL (9077.1ft md)
7561.1	17388.4	91.99	0.09	9731.3	277.8	9731.3	10582.9	~460ft HB X-OVER PNT TOE (17388.4ft md)
7543.7	17723.0	93.40	358.70	10065.3	286.8	10065.3	10917.1	LAST SURVEY - JUNE 8, 2018
7540.4	17779.0	93.40	358.70	10121.2	285.5	10121.2	10973.0	EXTRAPOLATION TO TD (40.058118; -104.840859)

AS DRILLED LOCAL COORDINATES:

SHL: 344ft FSL & 1819ft FWL Sec 24
HEEL: 658.9ft FSL & 2113.2ft FWL Sec 24
BHL: 55.7ft FNL & 2147.4ft FWL Sec 13

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
QUARTER CIRCLE 24-8HZ BHL (P5)	7511.0	10126.9	292.5	40° 3' 29.282 N	104° 50' 27.002 W
QUARTER CIRCLE 24-8HZ HEEL (P5)	7607.0	551.0	279.4	40° 1' 54.650 N	104° 50' 27.172 W



Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-8HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-308-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Project	WELD COUNTY (NAD 83)		
Map System:	Universal Transverse Mercator (US Survey Fee	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Zone 13N (108 W to 102 W)	Using geodetic scale factor	

Site	SE SW SEC. 13 T1N R67W 6th P.M.				
Site Position:		Northing:	14,537,819.11 usft	Latitude:	40° 1' 49.208 N
From:	Lat/Long	Easting:	1,684,634.02 usft	Longitude:	104° 50' 31.343 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.10 °

Well	QUARTER CIRCLE 24-8HZ					
Well Position	+N-S	0.0 usft	Northing:	14,537,818.89 usft	Latitude:	40° 1' 49.205 N
	+E-W	0.0 usft	Easting:	1,684,679.04 usft	Longitude:	104° 50' 30.764 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,941.0 usft

Wellbore	JOB #2018-308-461				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	17/05/2018	8.12	66.52	52,086

Design		FINAL SURVEYS		
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.0
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)
	0.0	0.0	0.0	0.00

Survey Program	Date	09/06/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
128.0	17,779.0	FINAL SURVEYS (JOB #2018-308-461)	APC_ISCWSA REV 2 MV Fixed:v2:crustal field declination		

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	4,961.0	0.0	0.0	0.0	0.00	0.00	0.00
128.0	0.44	289.74	128.0	4,833.0	0.2	-0.5	0.2	0.34	0.34	0.00
160.0	0.57	319.01	160.0	4,801.0	0.3	-0.7	0.3	0.89	0.41	91.47
192.0	0.66	301.26	192.0	4,769.0	0.5	-0.9	0.5	0.65	0.28	-55.47
224.0	0.83	307.06	224.0	4,737.0	0.8	-1.3	0.8	0.58	0.53	18.12
255.0	0.48	309.34	255.0	4,706.0	1.0	-1.6	1.0	1.13	-1.13	7.35
287.0	0.62	2.95	287.0	4,674.0	1.3	-1.7	1.3	1.60	0.44	167.53
318.0	0.35	15.17	318.0	4,643.0	1.5	-1.6	1.5	0.93	-0.87	39.42
350.0	0.53	28.79	350.0	4,611.0	1.7	-1.5	1.7	0.65	0.56	42.56
381.0	0.66	41.63	381.0	4,580.0	2.0	-1.3	2.0	0.60	0.42	41.42
413.0	0.79	14.91	413.0	4,548.0	2.3	-1.2	2.3	1.12	0.41	-83.50
444.0	0.40	342.04	444.0	4,517.0	2.7	-1.1	2.7	1.62	-1.26	-106.03
476.0	0.13	356.19	476.0	4,485.0	2.8	-1.2	2.8	0.86	-0.84	44.22

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-8HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-308-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
507.0	0.75	123.63	507.0	4,454.0	2.7	-1.0	2.7	2.69	2.00	411.10
539.0	0.97	111.24	539.0	4,422.0	2.5	-0.6	2.5	0.90	0.69	-38.72
571.0	1.41	115.28	571.0	4,390.0	2.2	0.0	2.2	1.40	1.37	12.62
603.0	2.11	113.43	603.0	4,358.0	1.8	0.9	1.8	2.19	2.19	-5.78
635.0	2.24	112.64	634.9	4,326.1	1.4	2.0	1.4	0.42	0.41	-2.47
666.0	3.47	115.28	665.9	4,295.1	0.7	3.4	0.7	3.99	3.97	8.52
698.0	4.26	112.73	697.8	4,263.2	-0.1	5.4	-0.1	2.53	2.47	-7.97
730.0	4.92	111.06	729.7	4,231.3	-1.1	7.8	-1.1	2.10	2.06	-5.22
762.0	5.58	112.11	761.6	4,199.4	-2.2	10.5	-2.2	2.08	2.06	3.28
793.0	5.71	114.66	792.4	4,168.6	-3.4	13.3	-3.4	0.91	0.42	8.23
825.0	6.68	113.87	824.2	4,136.8	-4.8	16.5	-4.8	3.04	3.03	-2.47
857.0	7.87	112.20	856.0	4,105.0	-6.4	20.2	-6.4	3.78	3.72	-5.22
889.0	8.26	111.24	887.7	4,073.3	-8.0	24.4	-8.0	1.29	1.22	-3.00
920.0	8.61	110.01	918.3	4,042.7	-9.6	28.6	-9.6	1.27	1.13	-3.97
952.0	8.39	111.41	950.0	4,011.0	-11.3	33.0	-11.3	0.94	-0.69	4.37
984.0	8.92	110.27	981.6	3,979.4	-13.0	37.5	-13.0	1.74	1.66	-3.56
1,016.0	9.84	109.04	1,013.2	3,947.8	-14.8	42.5	-14.8	2.94	2.87	-3.84
1,047.0	10.37	107.46	1,043.7	3,917.3	-16.5	47.6	-16.5	1.93	1.71	-5.10
1,079.0	10.94	107.37	1,075.2	3,885.8	-18.3	53.3	-18.3	1.78	1.78	-0.28
1,111.0	11.65	107.02	1,106.5	3,854.5	-20.1	59.3	-20.1	2.23	2.22	-1.09
1,142.0	12.00	107.81	1,136.9	3,824.1	-22.0	65.3	-22.0	1.24	1.13	2.55
1,174.0	12.08	107.02	1,168.2	3,792.8	-24.0	71.7	-24.0	0.57	0.25	-2.47
1,206.0	13.32	106.67	1,199.4	3,761.6	-26.0	78.4	-26.0	3.88	3.87	-1.09
1,238.0	14.33	106.14	1,230.5	3,730.5	-28.2	85.8	-28.2	3.18	3.16	-1.66
1,270.0	14.33	107.10	1,261.5	3,699.5	-30.5	93.3	-30.5	0.74	0.00	3.00
1,301.0	15.25	107.63	1,291.4	3,669.6	-32.8	100.9	-32.8	3.00	2.97	1.71
1,333.0	16.04	108.86	1,322.3	3,638.7	-35.5	109.1	-35.5	2.68	2.47	3.84
1,365.0	17.01	110.09	1,352.9	3,608.1	-38.6	117.7	-38.6	3.22	3.03	3.84
1,396.0	17.45	110.71	1,382.5	3,578.5	-41.8	126.3	-41.8	1.54	1.42	2.00
1,428.0	17.49	111.59	1,413.1	3,547.9	-45.2	135.2	-45.2	0.83	0.12	2.75
1,460.0	17.62	110.53	1,443.6	3,517.4	-48.7	144.2	-48.7	1.08	0.41	-3.31
1,492.0	16.39	110.09	1,474.2	3,486.8	-52.0	153.0	-52.0	3.86	-3.84	-1.37
1,523.0	16.35	109.04	1,503.9	3,457.1	-54.9	161.2	-54.9	0.96	-0.13	-3.39
1,555.0	16.44	109.57	1,534.6	3,426.4	-57.9	169.8	-57.9	0.55	0.28	1.66
1,586.0	15.25	110.44	1,564.4	3,396.6	-60.8	177.7	-60.8	3.91	-3.84	2.81
1,618.0	14.81	111.68	1,595.3	3,365.7	-63.7	185.5	-63.7	1.70	-1.37	3.87
1,650.0	13.80	110.88	1,626.4	3,334.6	-66.6	192.8	-66.6	3.22	-3.16	-2.50
1,682.0	13.93	110.18	1,657.4	3,303.6	-69.3	200.0	-69.3	0.66	0.41	-2.19
1,713.0	13.49	106.75	1,687.5	3,273.5	-71.6	207.0	-71.6	2.98	-1.42	-11.06
1,745.0	13.23	104.47	1,718.7	3,242.3	-73.6	214.1	-73.6	1.84	-0.81	-7.12
1,777.0	12.35	104.56	1,749.9	3,211.1	-75.4	221.0	-75.4	2.75	-2.75	0.28
1,803.0	12.17	105.08	1,775.3	3,185.7	-76.8	226.3	-76.8	0.81	-0.69	2.00
9 5/8" SURFACE CASING										
1,842.0	11.40	105.08	1,813.5	3,147.5	-78.9	234.0	-78.9	1.97	-1.97	0.00
1,956.0	10.30	117.40	1,925.4	3,035.6	-86.5	253.9	-86.5	2.25	-0.97	10.81
2,049.0	10.50	131.30	2,016.9	2,944.1	-95.9	267.7	-95.9	2.70	0.22	14.95
2,143.0	11.00	144.30	2,109.3	2,851.7	-108.9	279.3	-108.9	2.63	0.53	13.83
2,236.0	11.20	157.60	2,200.6	2,760.4	-124.4	288.0	-124.4	2.76	0.22	14.30
2,329.0	11.90	168.80	2,291.7	2,669.3	-142.2	293.3	-142.2	2.52	0.75	12.04
2,423.0	11.60	176.70	2,383.7	2,577.3	-161.1	295.7	-161.1	1.74	-0.32	8.40
2,515.0	11.10	185.20	2,473.9	2,487.1	-179.2	295.4	-179.2	1.90	-0.54	9.24
2,610.0	11.50	194.30	2,567.1	2,393.9	-197.5	292.3	-197.5	1.92	0.42	9.58
2,704.0	10.70	191.10	2,659.3	2,301.7	-215.1	288.3	-215.1	1.07	-0.85	-3.40

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-8HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-308-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2,798.0	9.60	191.10	2,751.9	2,209.1	-231.4	285.1	-231.4	1.17	-1.17	0.00
2,891.0	8.20	188.60	2,843.7	2,117.3	-245.5	282.6	-245.5	1.56	-1.51	-2.69
2,984.0	7.30	188.10	2,935.9	2,025.1	-257.9	280.8	-257.9	0.97	-0.97	-0.54
3,079.0	6.40	189.60	3,030.2	1,930.8	-269.1	279.0	-269.1	0.97	-0.95	1.58
3,173.0	5.70	189.10	3,123.7	1,837.3	-278.9	277.4	-278.9	0.75	-0.74	-0.53
3,268.0	4.90	190.10	3,218.3	1,742.7	-287.6	276.0	-287.6	0.85	-0.84	1.05
3,362.0	3.30	186.80	3,312.0	1,649.0	-294.2	274.9	-294.2	1.72	-1.70	-3.51
3,457.0	3.00	178.00	3,406.9	1,554.1	-299.4	274.7	-299.4	0.60	-0.32	-9.26
3,552.0	2.40	186.30	3,501.8	1,459.2	-303.9	274.6	-303.9	0.75	-0.63	8.74
3,646.0	0.80	196.30	3,595.8	1,365.2	-306.4	274.2	-306.4	1.72	-1.70	10.64
3,740.0	1.50	334.80	3,689.7	1,271.3	-306.0	273.5	-306.0	2.30	0.74	147.34
3,834.0	1.50	328.40	3,783.7	1,177.3	-303.8	272.3	-303.8	0.18	0.00	-6.81
3,929.0	1.00	292.10	3,878.7	1,082.3	-302.4	270.9	-302.4	0.96	-0.53	-38.21
4,023.0	0.90	271.40	3,972.7	988.3	-302.1	269.4	-302.1	0.38	-0.11	-22.02
4,118.0	1.00	259.20	4,067.7	893.3	-302.2	267.8	-302.2	0.24	0.11	-12.84
4,212.0	0.90	269.40	4,161.7	799.3	-302.4	266.3	-302.4	0.21	-0.11	10.85
4,306.0	1.00	260.00	4,255.6	705.4	-302.6	264.7	-302.6	0.20	0.11	-10.00
4,400.0	0.30	279.70	4,349.6	611.4	-302.7	263.7	-302.7	0.77	-0.74	20.96
4,495.0	0.10	204.00	4,444.6	516.4	-302.7	263.4	-302.7	0.31	-0.21	-79.68
4,589.0	0.40	233.30	4,538.6	422.4	-303.0	263.1	-303.0	0.34	0.32	31.17
4,682.0	1.00	235.00	4,631.6	329.4	-303.6	262.2	-303.6	0.65	0.65	1.83
4,776.0	1.10	220.90	4,725.6	235.4	-304.8	260.9	-304.8	0.29	0.11	-15.00
4,871.0	1.50	233.60	4,820.6	140.4	-306.2	259.3	-306.2	0.52	0.42	13.37
4,965.0	0.10	167.20	4,914.6	46.4	-307.0	258.3	-307.0	1.56	-1.49	-70.64
5,082.0	0.80	68.30	5,031.6	-70.6	-306.8	259.1	-306.8	0.70	0.60	-84.53
5,177.0	1.00	87.20	5,126.6	-165.6	-306.5	260.6	-306.5	0.37	0.21	19.89
5,272.0	0.90	86.80	5,221.5	-260.5	-306.4	262.1	-306.4	0.11	-0.11	-0.42
5,367.0	0.90	114.30	5,316.5	-355.5	-306.7	263.6	-306.7	0.45	0.00	28.95
5,461.0	0.80	49.10	5,410.5	-449.5	-306.6	264.7	-306.6	0.98	-0.11	-69.36
5,554.0	0.80	40.00	5,503.5	-542.5	-305.7	265.6	-305.7	0.14	0.00	-9.78
5,649.0	0.80	38.00	5,598.5	-637.5	-304.6	266.5	-304.6	0.03	0.00	-2.11
5,744.0	0.40	26.30	5,693.5	-732.5	-303.8	267.0	-303.8	0.44	-0.42	-12.32
5,839.0	0.40	9.10	5,788.5	-827.5	-303.2	267.2	-303.2	0.13	0.00	-18.11
5,933.0	0.50	345.00	5,882.5	-921.5	-302.5	267.2	-302.5	0.23	0.11	-25.64
6,026.0	0.30	337.10	5,975.5	-1,014.5	-301.8	267.0	-301.8	0.22	-0.22	-8.49
6,120.0	0.30	327.50	6,069.5	-1,108.5	-301.4	266.7	-301.4	0.05	0.00	-10.21
6,213.0	0.30	344.60	6,162.5	-1,201.5	-301.0	266.5	-301.0	0.10	0.00	18.39
6,306.0	0.60	356.90	6,255.5	-1,294.5	-300.2	266.5	-300.2	0.34	0.32	13.23
6,400.0	0.40	356.90	6,349.5	-1,388.5	-299.4	266.4	-299.4	0.21	-0.21	0.00
6,494.0	0.50	22.20	6,443.5	-1,482.5	-298.7	266.6	-298.7	0.23	0.11	26.91
6,587.0	0.50	62.60	6,536.5	-1,575.5	-298.2	267.1	-298.2	0.37	0.00	43.44
6,681.0	0.40	75.40	6,630.5	-1,669.5	-297.9	267.7	-297.9	0.15	-0.11	13.62
KOP										
6,737.0	1.01	11.75	6,686.5	-1,725.5	-297.4	268.0	-297.4	1.62	1.10	-113.67
6,775.0	1.60	3.00	6,724.5	-1,763.5	-296.5	268.1	-296.5	1.62	1.54	-23.01
6,868.0	5.10	5.30	6,817.3	-1,856.3	-291.1	268.6	-291.1	3.77	3.76	2.47
6,961.0	8.40	1.00	6,909.6	-1,948.6	-280.2	269.1	-280.2	3.59	3.55	-4.62
7,055.0	10.70	1.70	7,002.3	-2,041.3	-264.6	269.5	-264.6	2.45	2.45	0.74
7,149.0	13.90	9.50	7,094.2	-2,133.2	-244.7	271.6	-244.7	3.83	3.40	8.30
7,242.0	20.20	9.70	7,183.0	-2,222.0	-217.8	276.1	-217.8	6.77	6.77	0.22
7,335.0	25.60	9.90	7,268.7	-2,307.7	-182.2	282.3	-182.2	5.81	5.81	0.22
7,428.0	31.80	3.70	7,350.2	-2,389.2	-137.9	287.3	-137.9	7.39	6.67	-6.67
7,523.0	41.80	0.30	7,426.2	-2,465.2	-81.1	289.1	-81.1	10.74	10.53	-3.58

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-8HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-308-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,617.0	54.60	357.50	7,488.7	-2,527.7	-11.2	287.6	-11.2	13.79	13.62	-2.98
7,710.0	60.80	1.20	7,538.4	-2,577.4	67.3	286.8	67.3	7.47	6.67	3.98
~ ENTER LANDING BOX (7766.1ft md)										
7,766.1	68.85	2.34	7,562.3	-2,601.3	118.0	288.4	118.0	14.46	14.34	2.03
7,802.0	74.00	3.00	7,573.7	-2,612.7	152.0	290.0	152.0	14.46	14.35	1.85
7,896.0	80.30	0.20	7,594.6	-2,633.6	243.6	292.5	243.6	7.30	6.70	-2.98
HEEL (40.031205; -104.840837)										
7,970.0	85.10	358.46	7,604.0	-2,643.0	316.9	291.6	316.9	6.89	6.49	-2.35
7,990.0	86.40	358.00	7,605.5	-2,644.5	336.9	291.0	336.9	6.89	6.49	-2.32
8,085.0	87.90	357.50	7,610.2	-2,649.2	431.7	287.3	431.7	1.66	1.58	-0.53
8,179.0	89.00	357.60	7,612.7	-2,651.7	525.6	283.3	525.6	1.18	1.17	0.11
8,273.0	88.10	359.70	7,615.1	-2,654.1	619.5	281.1	619.5	2.43	-0.96	2.23
8,367.0	89.10	359.90	7,617.4	-2,656.4	713.5	280.8	713.5	1.08	1.06	0.21
8,459.0	88.10	0.20	7,619.7	-2,658.7	805.4	280.8	805.4	1.13	-1.09	0.33
8,553.0	88.40	0.10	7,622.5	-2,661.5	899.4	281.1	899.4	0.34	0.32	-0.11
8,646.0	89.00	0.10	7,624.6	-2,663.6	992.4	281.2	992.4	0.65	0.65	0.00
8,738.0	92.40	1.00	7,623.5	-2,662.5	1,084.3	282.1	1,084.3	3.82	3.70	0.98
8,832.0	93.20	0.90	7,618.9	-2,657.9	1,178.2	283.7	1,178.2	0.86	0.85	-0.11
8,927.0	89.80	0.40	7,616.4	-2,655.4	1,273.2	284.8	1,273.2	3.62	-3.58	-0.53
9,022.0	90.60	0.30	7,616.1	-2,655.1	1,368.2	285.3	1,368.2	0.85	0.84	-0.11
~ 460ft HB X-OVER PNT HEEL (9077.1ft md)										
9,077.1	89.49	0.18	7,616.1	-2,655.1	1,423.3	285.6	1,423.3	2.03	-2.02	-0.21
9,116.0	88.70	0.10	7,616.7	-2,655.7	1,462.2	285.7	1,462.2	2.03	-2.02	-0.21
9,210.0	88.80	359.40	7,618.7	-2,657.7	1,556.1	285.3	1,556.1	0.75	0.11	-0.74
9,302.0	89.70	359.50	7,619.9	-2,658.9	1,648.1	284.4	1,648.1	0.98	0.98	0.11
9,396.0	90.50	359.60	7,619.8	-2,658.8	1,742.1	283.6	1,742.1	0.86	0.85	0.11
9,489.0	91.70	0.10	7,618.0	-2,657.0	1,835.1	283.4	1,835.1	1.40	1.29	0.54
9,584.0	91.50	359.50	7,615.3	-2,654.3	1,930.1	283.1	1,930.1	0.67	-0.21	-0.63
9,679.0	92.90	359.40	7,611.7	-2,650.7	2,025.0	282.1	2,025.0	1.48	1.47	-0.11
9,774.0	91.60	0.20	7,608.0	-2,647.0	2,119.9	281.8	2,119.9	1.61	-1.37	0.84
9,867.0	89.90	0.90	7,606.7	-2,645.7	2,212.9	282.7	2,212.9	1.98	-1.83	0.75
9,960.0	89.90	0.20	7,606.9	-2,645.9	2,305.9	283.6	2,305.9	0.75	0.00	-0.75
10,055.0	91.00	359.80	7,606.2	-2,645.2	2,400.9	283.6	2,400.9	1.23	1.16	-0.42
10,149.0	92.00	359.60	7,603.7	-2,642.7	2,494.8	283.1	2,494.8	1.08	1.06	-0.21
10,242.0	92.20	358.90	7,600.3	-2,639.3	2,587.8	281.9	2,587.8	0.78	0.22	-0.75
10,335.0	90.60	358.40	7,598.0	-2,637.0	2,680.7	279.7	2,680.7	1.80	-1.72	-0.54
10,429.0	91.60	358.10	7,596.2	-2,635.2	2,774.7	276.8	2,774.7	1.11	1.06	-0.32
10,523.0	92.10	356.90	7,593.2	-2,632.2	2,868.5	272.7	2,868.5	1.38	0.53	-1.28
10,617.0	91.30	358.70	7,590.4	-2,629.4	2,962.4	269.1	2,962.4	2.09	-0.85	1.91
10,710.0	88.30	359.10	7,590.7	-2,629.7	3,055.4	267.3	3,055.4	3.25	-3.23	0.43
10,802.0	89.70	359.90	7,592.3	-2,631.3	3,147.4	266.5	3,147.4	1.75	1.52	0.87
10,896.0	90.70	0.00	7,592.0	-2,631.0	3,241.4	266.5	3,241.4	1.07	1.06	0.11
10,989.0	91.60	0.40	7,590.1	-2,629.1	3,334.3	266.8	3,334.3	1.06	0.97	0.43
11,082.0	92.70	1.00	7,586.6	-2,625.6	3,427.3	267.9	3,427.3	1.35	1.18	0.65
11,175.0	91.60	0.30	7,583.2	-2,622.2	3,520.2	269.0	3,520.2	1.40	-1.18	-0.75
11,267.0	90.20	0.20	7,581.7	-2,620.7	3,612.2	269.4	3,612.2	1.53	-1.52	-0.11
11,360.0	89.00	359.90	7,582.4	-2,621.4	3,705.2	269.5	3,705.2	1.33	-1.29	-0.32
11,454.0	89.30	0.50	7,583.7	-2,622.7	3,799.2	269.8	3,799.2	0.71	0.32	0.64
11,547.0	90.60	0.70	7,583.8	-2,622.8	3,892.1	270.8	3,892.1	1.41	1.40	0.22
11,640.0	91.70	1.00	7,582.0	-2,621.0	3,985.1	272.1	3,985.1	1.23	1.18	0.32
11,734.0	92.10	1.20	7,578.8	-2,617.8	4,079.0	273.9	4,079.0	0.48	0.43	0.21
11,828.0	90.80	0.80	7,576.5	-2,615.5	4,173.0	275.6	4,173.0	1.45	-1.38	-0.43
11,921.0	90.10	1.10	7,575.7	-2,614.7	4,266.0	277.1	4,266.0	0.82	-0.75	0.32

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-8HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-308-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,016.0	91.90	1.50	7,574.1	-2,613.1	4,360.9	279.3	4,360.9	1.94	1.89	0.42
12,110.0	90.80	0.10	7,571.9	-2,610.9	4,454.9	280.6	4,454.9	1.89	-1.17	-1.49
12,204.0	89.80	359.60	7,571.4	-2,610.4	4,548.9	280.3	4,548.9	1.19	-1.06	-0.53
12,297.0	90.50	359.60	7,571.1	-2,610.1	4,641.9	279.7	4,641.9	0.75	0.75	0.00
12,391.0	92.00	0.10	7,569.1	-2,608.1	4,735.9	279.4	4,735.9	1.68	1.60	0.53
12,484.0	89.30	359.10	7,568.0	-2,607.0	4,828.9	278.8	4,828.9	3.10	-2.90	-1.08
12,579.0	90.20	359.30	7,568.4	-2,607.4	4,923.8	277.5	4,923.8	0.97	0.95	0.21
12,673.0	92.50	0.40	7,566.2	-2,605.2	5,017.8	277.2	5,017.8	2.71	2.45	1.17
12,766.0	91.40	358.70	7,563.1	-2,602.1	5,110.7	276.5	5,110.7	2.18	-1.18	-1.83
12,859.0	90.70	357.60	7,561.4	-2,600.4	5,203.7	273.5	5,203.7	1.40	-0.75	-1.18
12,953.0	89.50	357.60	7,561.2	-2,600.2	5,297.6	269.6	5,297.6	1.28	-1.28	0.00
13,045.0	90.80	357.90	7,561.0	-2,600.0	5,389.5	265.9	5,389.5	1.45	1.41	0.33
13,139.0	89.20	359.00	7,561.0	-2,600.0	5,483.5	263.4	5,483.5	2.07	-1.70	1.17
13,234.0	90.10	359.10	7,561.5	-2,600.5	5,578.5	261.8	5,578.5	0.95	0.95	0.11
13,329.0	90.40	1.00	7,561.1	-2,600.1	5,673.5	261.9	5,673.5	2.02	0.32	2.00
13,421.0	91.70	1.50	7,559.4	-2,598.4	5,765.4	263.9	5,765.4	1.51	1.41	0.54
13,516.0	90.60	1.60	7,557.5	-2,596.5	5,860.4	266.5	5,860.4	1.16	-1.16	0.11
13,609.0	91.60	1.70	7,555.7	-2,594.7	5,953.3	269.2	5,953.3	1.08	1.08	0.11
13,703.0	90.90	1.60	7,553.7	-2,592.7	6,047.2	271.9	6,047.2	0.75	-0.74	-0.11
13,797.0	89.90	0.10	7,553.0	-2,592.0	6,141.2	273.3	6,141.2	1.92	-1.06	-1.60
13,891.0	89.50	359.00	7,553.5	-2,592.5	6,235.2	272.5	6,235.2	1.25	-0.43	-1.17
13,986.0	90.20	359.20	7,553.8	-2,592.8	6,330.2	271.0	6,330.2	0.77	0.74	0.21
14,080.0	91.20	359.50	7,552.6	-2,591.6	6,424.2	270.0	6,424.2	1.11	1.06	0.32
14,174.0	91.10	359.50	7,550.7	-2,589.7	6,518.2	269.1	6,518.2	0.11	-0.11	0.00
14,269.0	90.90	358.80	7,549.1	-2,588.1	6,613.1	267.7	6,613.1	0.77	-0.21	-0.74
14,364.0	91.20	0.00	7,547.3	-2,586.3	6,708.1	266.7	6,708.1	1.30	0.32	1.26
14,459.0	90.30	359.50	7,546.1	-2,585.1	6,803.1	266.3	6,803.1	1.08	-0.95	-0.53
14,553.0	91.00	0.20	7,545.0	-2,584.0	6,897.1	266.1	6,897.1	1.05	0.74	0.74
14,647.0	88.90	359.40	7,545.1	-2,584.1	6,991.1	265.8	6,991.1	2.39	-2.23	-0.85
14,741.0	87.90	358.80	7,547.7	-2,586.7	7,085.1	264.3	7,085.1	1.24	-1.06	-0.64
14,836.0	88.80	0.50	7,550.5	-2,589.5	7,180.0	263.7	7,180.0	2.02	0.95	1.79
14,929.0	89.80	1.30	7,551.6	-2,590.6	7,273.0	265.2	7,273.0	1.38	1.08	0.86
15,022.0	89.10	359.70	7,552.5	-2,591.5	7,366.0	266.0	7,366.0	1.88	-0.75	-1.72
15,117.0	91.60	2.30	7,551.9	-2,590.9	7,460.9	267.6	7,460.9	3.80	2.63	2.74
15,211.0	92.90	2.90	7,548.2	-2,587.2	7,554.8	271.9	7,554.8	1.52	1.38	0.64
15,305.0	92.20	1.80	7,544.0	-2,583.0	7,648.6	275.7	7,648.6	1.39	-0.74	-1.17
15,398.0	89.40	0.60	7,542.7	-2,581.7	7,741.6	277.7	7,741.6	3.28	-3.01	-1.29
15,493.0	90.30	2.80	7,543.0	-2,582.0	7,836.5	280.5	7,836.5	2.50	0.95	2.32
15,589.0	88.10	0.40	7,544.3	-2,583.3	7,932.4	283.2	7,932.4	3.39	-2.29	-2.50
15,682.0	88.50	359.50	7,547.1	-2,586.1	8,025.4	283.1	8,025.4	1.06	0.43	-0.97
15,776.0	88.90	359.70	7,549.2	-2,588.2	8,119.4	282.4	8,119.4	0.48	0.43	0.21
15,869.0	89.40	359.50	7,550.6	-2,589.6	8,212.4	281.8	8,212.4	0.58	0.54	-0.22
15,963.0	90.00	0.20	7,551.1	-2,590.1	8,306.4	281.5	8,306.4	0.98	0.64	0.74
16,056.0	90.20	0.30	7,550.9	-2,589.9	8,399.4	282.0	8,399.4	0.24	0.22	0.11
16,148.0	90.60	0.80	7,550.3	-2,589.3	8,491.4	282.8	8,491.4	0.70	0.43	0.54
16,243.0	89.80	0.20	7,550.0	-2,589.0	8,586.4	283.7	8,586.4	1.05	-0.84	-0.63
16,336.0	90.10	0.20	7,550.0	-2,589.0	8,679.3	284.0	8,679.3	0.32	0.32	0.00
16,431.0	89.60	0.40	7,550.3	-2,589.3	8,774.3	284.5	8,774.3	0.57	-0.53	0.21
16,526.0	89.90	359.40	7,550.7	-2,589.7	8,869.3	284.3	8,869.3	1.10	0.32	-1.05
16,620.0	88.60	358.20	7,551.9	-2,590.9	8,963.3	282.4	8,963.3	1.88	-1.38	-1.28
16,712.0	89.00	358.90	7,553.9	-2,592.9	9,055.3	280.0	9,055.3	0.88	0.43	0.76
16,806.0	89.20	359.10	7,555.3	-2,594.3	9,149.2	278.4	9,149.2	0.30	0.21	0.21
16,898.0	88.10	357.40	7,557.5	-2,596.5	9,241.2	275.6	9,241.2	2.20	-1.20	-1.85

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-8HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-308-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Subsea Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,992.0	87.80	359.00	7,560.9	-2,599.9	9,335.1	272.6	9,335.1	1.73	-0.32	1.70
17,086.0	88.80	0.80	7,563.7	-2,602.7	9,429.0	272.5	9,429.0	2.19	1.06	1.91
17,181.0	90.10	1.60	7,564.6	-2,603.6	9,524.0	274.5	9,524.0	1.61	1.37	0.84
17,275.0	90.80	1.50	7,563.8	-2,602.8	9,617.9	277.0	9,617.9	0.75	0.74	-0.11
17,368.0	91.80	359.60	7,561.7	-2,600.7	9,710.9	277.9	9,710.9	2.31	1.08	-2.04
~460ft HB X-OVER PNT TOE (17388.4ft md)										
17,388.4	91.99	0.09	7,561.1	-2,600.1	9,731.3	277.8	9,731.3	2.57	0.94	2.39
17,464.0	92.70	1.90	7,558.0	-2,597.0	9,806.8	279.1	9,806.8	2.57	0.94	2.40
17,557.0	93.10	2.40	7,553.3	-2,592.3	9,899.6	282.6	9,899.6	0.69	0.43	0.54
17,628.0	93.30	2.60	7,549.3	-2,588.3	9,970.5	285.7	9,970.5	0.40	0.28	0.28
LAST SURVEY - JUNE 8, 2018										
17,723.0	93.40	358.70	7,543.7	-2,582.7	10,065.3	286.8	10,065.3	4.10	0.11	-4.11
EXTRAPOLATION TO TD (40.058118; -104.840859)										
17,779.0	93.40	358.70	7,540.4	-2,579.4	10,121.2	285.5	10,121.2	0.00	0.00	0.00

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well QUARTER CIRCLE 24-8HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 4961.0usft (PD461)
Site:	SE SW SEC. 13 T1N R67W 6th P.M.	MD Reference:	KB 20' @ 4961.0usft (PD461)
Well:	QUARTER CIRCLE 24-8HZ	North Reference:	True
Wellbore:	JOB #2018-308-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Targets									
Target Name	- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	
- Shape		(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)	Latitude Longitude
QUARTER CIRCLE 2	- survey misses target center by 84.6usft at 11556.4usft MD (7583.7 TVD, 3901.6 N, 270.9 E)	0.00	0.00	7,500.0	3,899.7	282.9	14,541,717.53	1,684,954.90	40° 2' 27.743 N 104° 50' 27.127 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 6.9usft at 8204.4usft MD (7613.2 TVD, 550.9 N, 282.4 E)	0.00	0.00	7,607.0	551.0	279.4	14,538,370.15	1,684,957.36	40° 1' 54.650 N 104° 50' 27.172 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 30.2usft at 17779.0usft MD (7540.4 TVD, 10121.2 N, 285.5 E)	0.00	0.00	7,511.0	10,126.9	289.1	14,547,942.28	1,684,950.05	40° 3' 29.282 N 104° 50' 27.046 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 31.2usft at 17779.0usft MD (7540.4 TVD, 10121.2 N, 285.5 E)	0.00	0.00	7,510.0	10,126.9	289.1	14,547,942.28	1,684,950.05	40° 3' 29.282 N 104° 50' 27.046 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 6.9usft at 8204.4usft MD (7613.2 TVD, 550.9 N, 282.4 E)	0.00	0.00	7,607.0	551.0	279.4	14,538,370.15	1,684,957.36	40° 1' 54.650 N 104° 50' 27.172 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 11.3usft at 6839.7usft MD (6789.1 TVD, -293.3 N, 268.4 E)	0.00	0.00	6,788.7	-287.8	278.2	14,537,531.69	1,684,957.68	40° 1' 46.361 N 104° 50' 27.187 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 30.2usft at 17779.0usft MD (7540.4 TVD, 10121.2 N, 285.5 E)	0.00	0.00	7,511.0	10,126.9	289.1	14,547,942.28	1,684,950.05	40° 3' 29.282 N 104° 50' 27.046 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 30.8usft at 17779.0usft MD (7540.4 TVD, 10121.2 N, 285.5 E)	0.00	0.00	7,511.0	10,126.9	292.5	14,547,942.29	1,684,953.46	40° 3' 29.282 N 104° 50' 27.002 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 13.3usft at 8204.2usft MD (7613.2 TVD, 550.7 N, 282.4 E)	0.00	0.00	7,600.2	551.0	279.4	14,538,370.15	1,684,957.36	40° 1' 54.650 N 104° 50' 27.172 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 65.4usft at 12356.1usft MD (7570.1 TVD, 4701.0 N, 279.4 E)	0.00	0.00	7,505.0	4,699.6	285.0	14,542,517.12	1,684,955.60	40° 2' 35.648 N 104° 50' 27.099 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 10.2usft at 6839.6usft MD (6788.9 TVD, -293.3 N, 268.4 E)	0.00	0.00	6,788.9	-293.7	278.5	14,537,525.84	1,684,957.98	40° 1' 46.303 N 104° 50' 27.183 W
- Point									
QUARTER CIRCLE 2	- survey misses target center by 177.4usft at 7045.6usft MD (6993.1 TVD, -266.3 N, 269.4 E)	0.00	0.00	6,963.6	-91.6	278.7	14,537,727.79	1,684,957.83	40° 1' 48.299 N 104° 50' 27.181 W
- Point									

Survey Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(usft)	(usft)	+N/-S	+E/-W	
1,842.0	1,813.5	-78.9	234.0	9 5/8" SURFACE CASING
6,737.0	6,686.5	-297.4	268.0	KOP
7,766.1	7,562.3	118.0	288.4	~ ENTER LANDING BOX (7766.1ft md)
7,970.0	7,604.0	316.9	291.6	HEEL (40.031205; -104.840837)
9,077.1	7,616.1	1,423.3	285.6	~ 460ft HB X-OVER PNT HEEL (9077.1ft md)
17,388.4	7,561.1	9,731.3	277.8	~460ft HB X-OVER PNT TOE (17388.4ft md)
17,723.0	7,543.7	10,065.3	286.8	LAST SURVEY - JUNE 8, 2018
17,779.0	7,540.4	10,121.2	285.5	EXTRAPOLATION TO TD (40.058118; -104.840859)