

ANADARKO PETROLEUM CORP

WELD COUNTY (NAD 83)

SW SE SEC. 25 T2N R66W 6th P.M.

GRACIE 24-14HZ

JOB # 2018-390-461

20 July, 2018

Survey: FINAL SURVEYS





Project: WELD COUNTY (NAD 83)
 Site: SW SE SEC. 25 T2N R66W 6th P.M.
 Well: GRACIE 24-14HZ
 Wellbore: JOB # 2018-390-461
 Design: FINAL SURVEYS

ANNOTATIONS

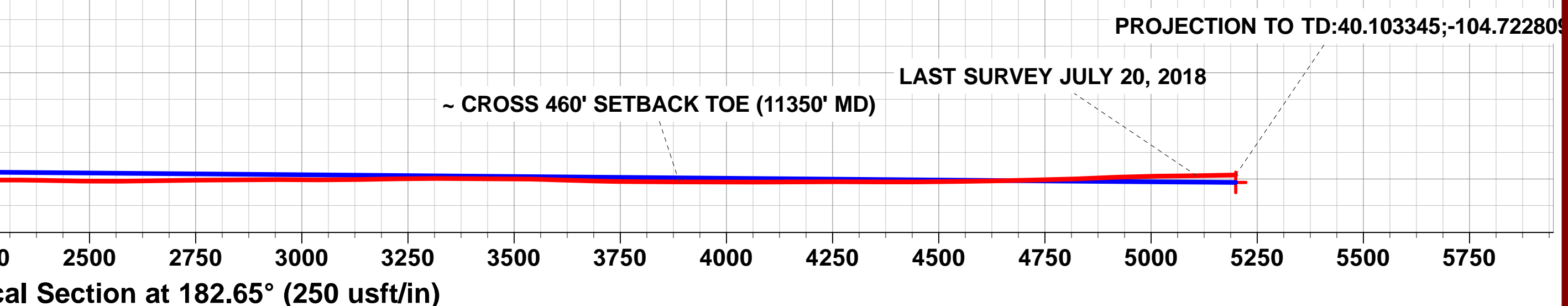
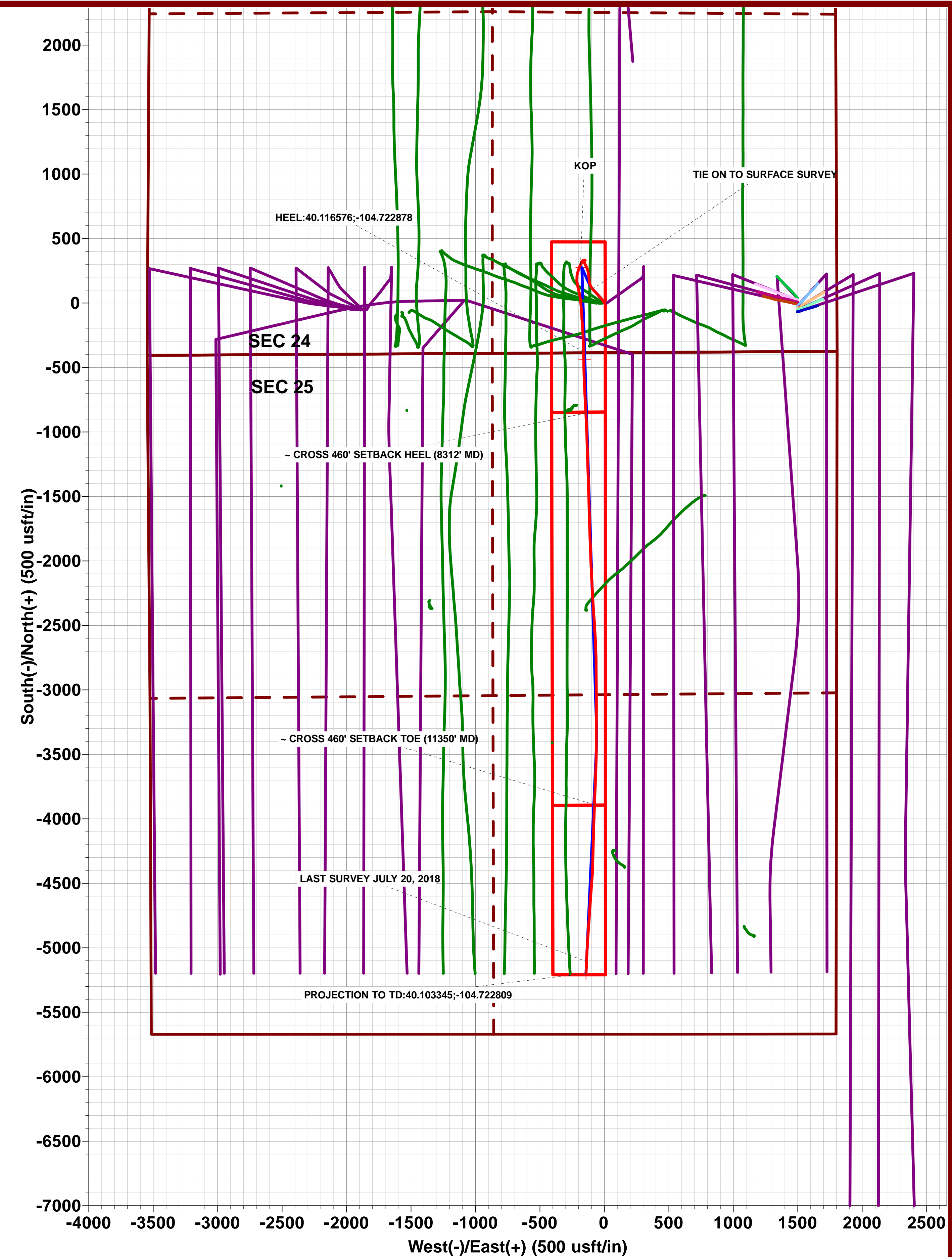
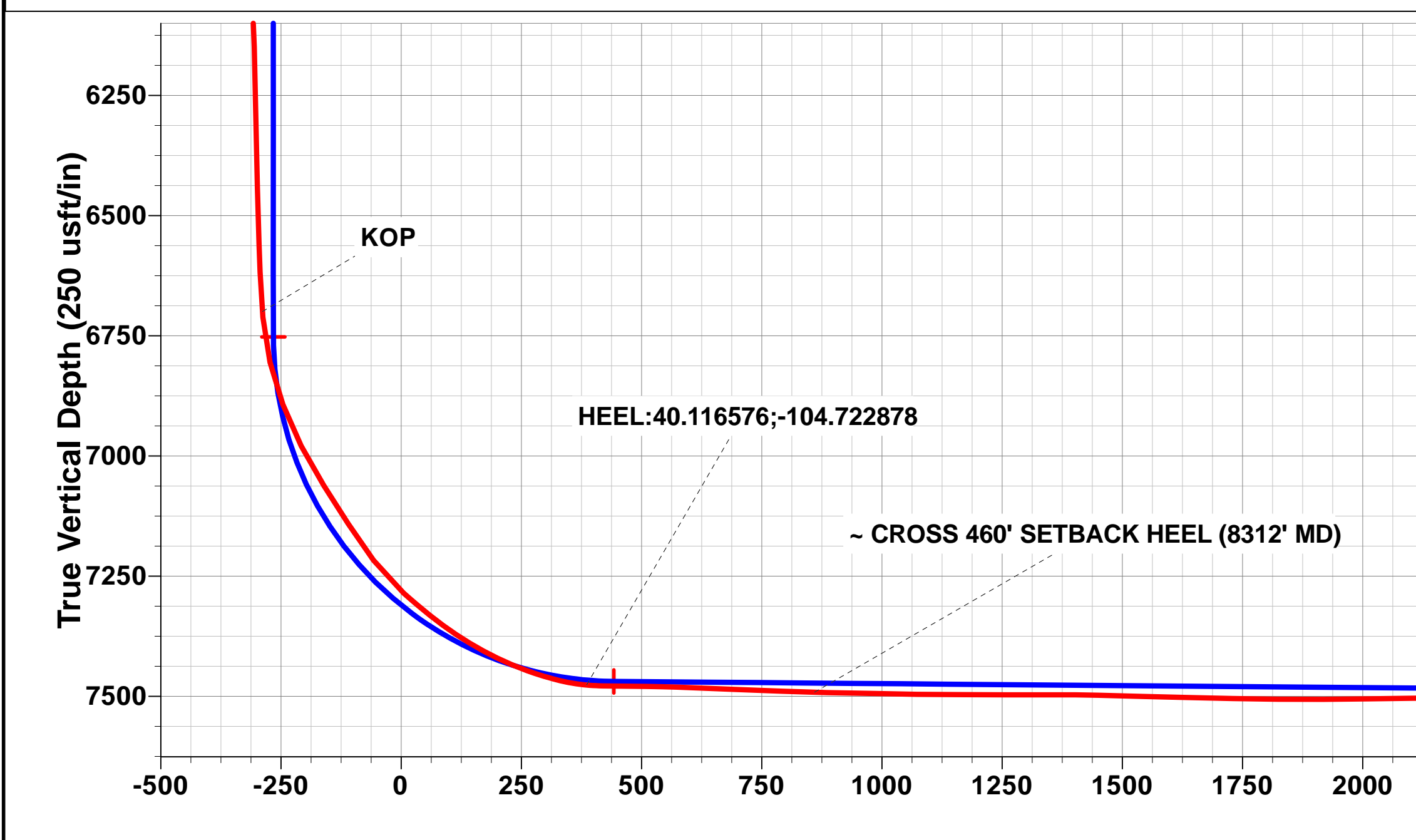
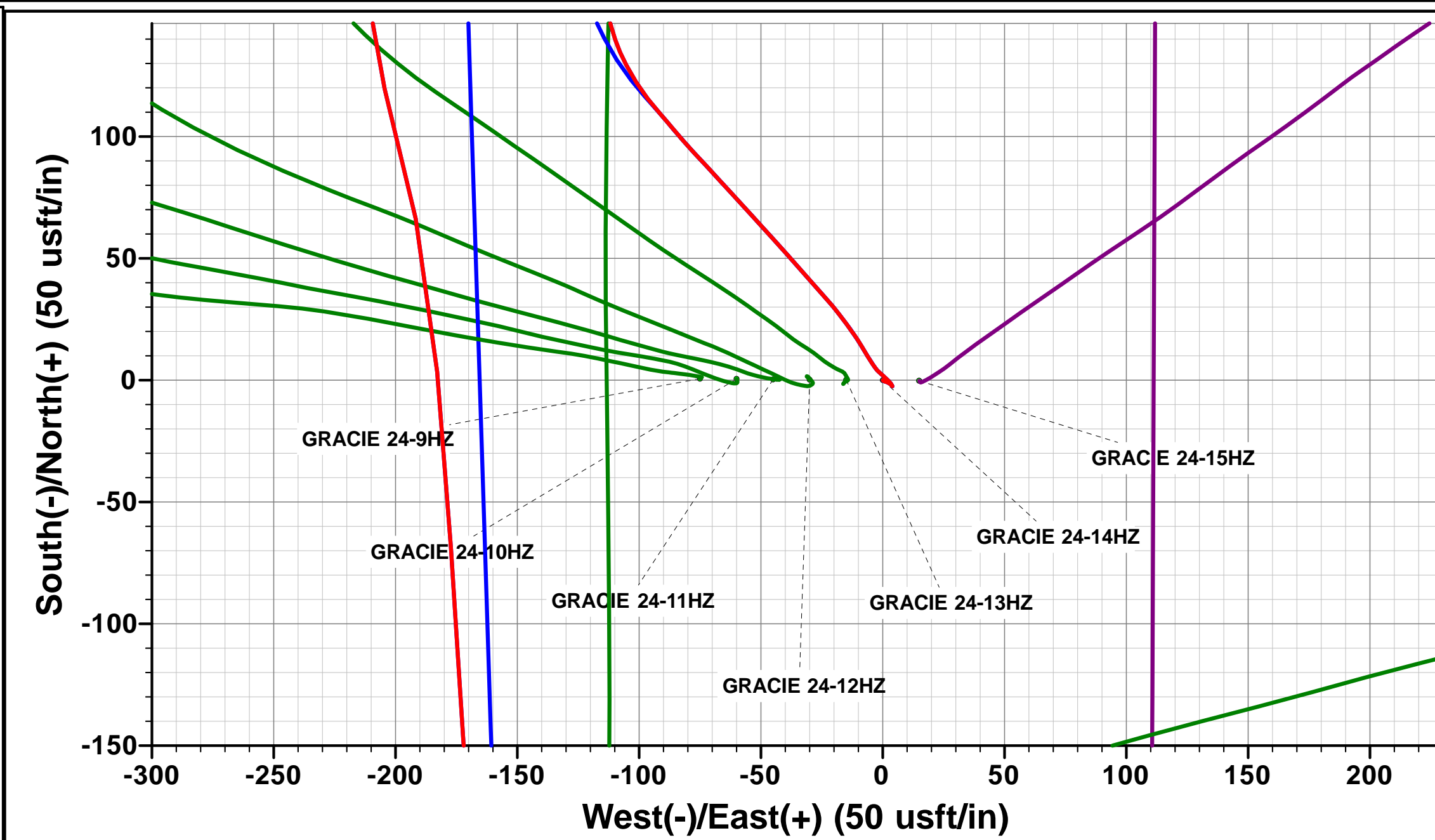
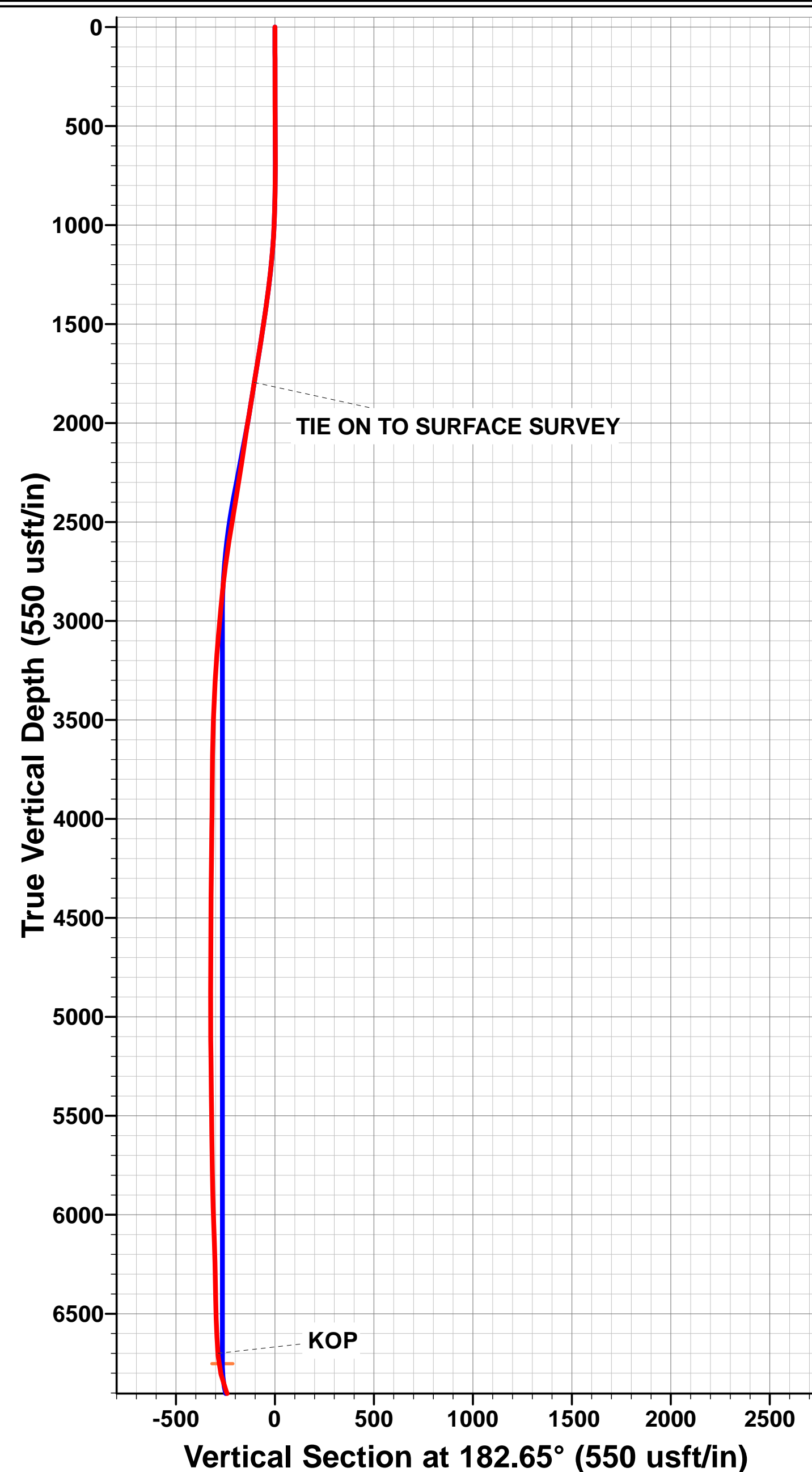
TVD	MD	Inc	Azi	+N/-S	+E/-W	VSec	Departure	Annotation
1794.9	1808.0	11.87	318.33	108.9	-91.0	-104.6	151.7	TIE ON TO SURFACE SURVEY
6699.6	6730.0	4.92	208.75	297.5	-184.9	-288.6	449.8	KOP
7476.6	7836.0	84.70	178.64	-378.6	-161.5	385.7	1134.9	HEEL:40.116576;-104.722878
7491.6	8312.0	88.47	177.52	-853.9	-143.1	859.6	1610.3	~ CROSS 460' SETBACK HEEL (8312' MD)
7506.9	11350.0	89.78	182.02	-3889.6	-76.5	3888.9	4648.0	~ CROSS 460' SETBACK TOE (11350' MD)
7492.3	12569.0	91.03	182.71	-5106.6	-138.0	5107.5	5866.8	LAST SURVEY JULY 20, 2018
7490.6	12661.0	91.03	182.71	-5198.5	-142.4	5199.5	5958.8	PROJECTION TO TD:40.103345;-104.722809

PROPOSED LOCAL COORDINATES:

SHL: 385ft FSL & 1789ft FEL Sec 24
 HEEL: 7.2ft FNL & 1510.9ft FEL Sec 24
 BHL: 471ft FSL & 1495.7ft FEL Sec 25

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude
BHL - GRACIE 24-14HZ (P2)	7508.0	-5198.5	-142.7	40° 6' 12.042 N	104° 43' 22.116 W
HEEL - GRACIE 24-14HZ (P2)	7469.0	-435.8	-151.6	40° 6' 59.107 N	104° 43' 22.231 W
KOP - GRACIE 24-14HZ (P3)	6752.3	274.1	-174.1	40° 7' 6.123 N	104° 43' 22.521 W



Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-14HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 5075.0usft (PD 461)
Site:	SW SE SEC. 25 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5075.0usft (PD 461)
Well:	GRACIE 24-14HZ	North Reference:	True
Wellbore:	JOB # 2018-390-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

Project	WELD COUNTY (NAD 83)		
Map System:	Universal Transverse Mercator (US Survey Feet)	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	SW SE SEC. 25 T2N R66W 6th P.M.				
Site Position:		Northing:	14,569,683.89 usft	Latitude:	40° 7' 3.420 N
From:	Lat/Long	Easting:	1,717,978.33 usft	Longitude:	104° 43' 21.245 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.18 °

Well	GRACIE 24-14HZ					
Well Position	+N-S	0.0 usft	Northing:	14,569,683.52 usft	Latitude:	40° 7' 3.414 N
	+E-W	0.0 usft	Easting:	1,718,053.27 usft	Longitude:	104° 43' 20.280 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	5,055.0 usft

Wellbore	JOB # 2018-390-461				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	06/06/2018	8.06	66.61	52,137

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	182.65

Survey Program	Date	20/07/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
129.0	12,661.0	FINAL SURVEYS (JOB # 2018-390-461)	APC_ISCWSA REV 2 MWD+	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	5,075.0	0.0	0.0	0.0	0.00	0.00	0.00
129.0	0.26	122.34	129.0	4,946.0	-0.2	0.2	0.1	0.20	0.20	0.00
161.0	0.40	138.95	161.0	4,914.0	-0.3	0.4	0.3	0.53	0.44	51.91
193.0	0.26	119.70	193.0	4,882.0	-0.4	0.5	0.4	0.55	-0.44	-60.16
224.0	0.48	110.38	224.0	4,851.0	-0.5	0.7	0.4	0.73	0.71	-30.06
256.0	0.31	91.49	256.0	4,819.0	-0.5	0.9	0.5	0.66	-0.53	-59.03
288.0	0.35	81.82	288.0	4,787.0	-0.5	1.1	0.5	0.21	0.12	-30.22
319.0	0.22	126.21	319.0	4,756.0	-0.5	1.2	0.5	0.80	-0.42	143.19
351.0	0.53	125.50	351.0	4,724.0	-0.7	1.4	0.6	0.97	0.97	-2.22
383.0	0.40	91.66	383.0	4,692.0	-0.8	1.6	0.7	0.93	-0.41	-105.75
415.0	0.40	115.75	415.0	4,660.0	-0.8	1.9	0.7	0.52	0.00	75.28
446.0	0.66	122.25	446.0	4,629.0	-0.9	2.1	0.8	0.86	0.84	20.97
478.0	0.70	125.41	478.0	4,597.0	-1.2	2.4	1.0	0.17	0.12	9.87

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-14HZ
Project:	WELD COUNTY (NAD 83)	TD Reference:	KB 20' @ 5075.0usft (PD 461)
Site:	SW SE SEC. 25 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5075.0usft (PD 461)
Well:	GRACIE 24-14HZ	North Reference:	True
Wellbore:	JOB # 2018-390-461	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)	
509.0	0.79	114.34	509.0	4,566.0	-1.4	2.8	1.2	0.55	0.29	-35.71	
541.0	0.57	122.25	541.0	4,534.0	-1.5	3.1	1.4	0.75	-0.69	24.72	
604.0	0.88	138.60	604.0	4,471.0	-2.1	3.7	1.9	0.59	0.49	25.95	
636.0	0.53	152.84	636.0	4,439.0	-2.4	3.9	2.2	1.21	-1.09	44.50	
668.0	0.13	292.85	668.0	4,407.0	-2.5	4.0	2.3	1.98	-1.25	437.53	
700.0	0.40	327.56	700.0	4,375.0	-2.4	3.9	2.2	0.94	0.84	108.47	
731.0	0.75	338.72	731.0	4,344.0	-2.1	3.7	1.9	1.18	1.13	36.00	
763.0	0.83	335.82	763.0	4,312.0	-1.7	3.6	1.5	0.28	0.25	-9.06	
795.0	1.67	320.18	795.0	4,280.0	-1.1	3.2	1.0	2.81	2.62	-48.87	
826.0	1.76	315.26	826.0	4,249.0	-0.4	2.5	0.3	0.56	0.29	-15.87	
858.0	2.20	315.79	857.9	4,217.1	0.3	1.8	-0.4	1.38	1.37	1.66	
890.0	2.33	314.03	889.9	4,185.1	1.2	0.9	-1.3	0.46	0.41	-5.50	
922.0	2.24	308.67	921.9	4,153.1	2.1	-0.1	-2.1	0.72	-0.28	-16.75	
953.0	2.50	311.39	952.9	4,122.1	2.9	-1.1	-2.9	0.91	0.84	8.77	
984.0	3.16	316.49	983.8	4,091.2	4.0	-2.2	-3.9	2.28	2.13	16.45	
1,016.0	3.38	323.34	1,015.8	4,059.2	5.4	-3.3	-5.2	1.40	0.69	21.41	
1,048.0	3.82	329.06	1,047.7	4,027.3	7.0	-4.4	-6.8	1.77	1.37	17.87	
1,080.0	4.70	328.79	1,079.6	3,995.4	9.1	-5.7	-8.8	2.75	2.75	-0.84	
1,143.0	5.71	329.06	1,142.4	3,932.6	14.0	-8.6	-13.6	1.60	1.60	0.43	
1,175.0	6.24	325.72	1,174.2	3,900.8	16.8	-10.4	-16.3	1.98	1.66	-10.44	
1,238.0	7.91	324.13	1,236.7	3,838.3	23.1	-14.9	-22.4	2.67	2.65	-2.52	
1,270.0	8.75	322.38	1,268.4	3,806.6	26.8	-17.7	-26.0	2.74	2.62	-5.47	
1,301.0	9.67	319.56	1,299.0	3,776.0	30.7	-20.8	-29.7	3.30	2.97	-9.10	
1,333.0	10.33	318.33	1,330.5	3,744.5	34.9	-24.4	-33.7	2.17	2.06	-3.84	
1,365.0	10.68	318.25	1,361.9	3,713.1	39.2	-28.3	-37.9	1.09	1.09	-0.25	
1,396.0	11.38	318.95	1,392.4	3,682.6	43.7	-32.2	-42.1	2.30	2.26	2.26	
1,427.0	11.38	318.69	1,422.8	3,652.2	48.3	-36.3	-46.5	0.17	0.00	-0.84	
1,459.0	11.47	318.33	1,454.1	3,620.9	53.0	-40.5	-51.1	0.36	0.28	-1.12	
1,491.0	11.65	317.45	1,485.5	3,589.5	57.8	-44.8	-55.6	0.79	0.56	-2.75	
1,522.0	11.82	317.98	1,515.8	3,559.2	62.4	-49.0	-60.1	0.65	0.55	1.71	
1,554.0	11.91	317.54	1,547.1	3,527.9	67.3	-53.4	-64.8	0.40	0.28	-1.37	
1,617.0	12.48	317.28	1,608.7	3,466.3	77.1	-62.4	-74.1	0.91	0.90	-0.41	
1,649.0	12.83	317.89	1,639.9	3,435.1	82.3	-67.2	-79.1	1.17	1.09	1.91	
1,681.0	13.23	316.93	1,671.1	3,403.9	87.6	-72.1	-84.2	1.42	1.25	-3.00	
1,713.0	13.58	317.10	1,702.2	3,372.8	93.0	-77.1	-89.4	1.10	1.09	0.53	
1,744.0	12.96	318.77	1,732.4	3,342.6	98.3	-81.9	-94.4	2.35	-2.00	5.39	
1,776.0	12.83	320.18	1,763.6	3,311.4	103.7	-86.5	-99.6	1.06	-0.41	4.41	
TIE ON TO SURFACE SURVEY											
1,808.0	11.87	318.33	1,794.9	3,280.1	108.9	-91.0	-104.6	3.24	-3.00	-5.78	
1,935.0	10.95	332.37	1,919.4	3,155.6	129.4	-105.3	-124.4	2.30	-0.72	11.06	
2,029.0	9.47	345.84	2,011.9	3,063.1	144.8	-111.3	-139.5	2.98	-1.57	14.33	
2,121.0	8.77	343.31	2,102.7	2,972.3	158.8	-115.2	-153.3	0.88	-0.76	-2.75	
2,215.0	8.52	355.67	2,195.7	2,879.3	172.6	-117.8	-167.0	1.99	-0.27	13.15	
2,309.0	9.96	357.21	2,288.5	2,786.5	187.7	-118.7	-182.0	1.55	1.53	1.64	
2,402.0	9.00	355.79	2,380.2	2,694.8	203.0	-119.6	-197.3	1.06	-1.03	-1.53	
2,497.0	9.16	349.61	2,474.0	2,601.0	217.8	-121.5	-212.0	1.04	0.17	-6.51	
2,591.0	9.85	349.08	2,566.7	2,508.3	233.1	-124.4	-227.1	0.74	0.73	-0.56	
2,684.0	8.77	346.00	2,658.5	2,416.5	247.8	-127.6	-241.6	1.28	-1.16	-3.31	
2,777.0	7.32	341.26	2,750.6	2,324.4	260.3	-131.2	-253.9	1.71	-1.56	-5.10	
2,870.0	6.51	337.13	2,842.9	2,232.1	270.8	-135.2	-264.2	1.02	-0.87	-4.44	
2,964.0	6.02	334.85	2,936.3	2,138.7	280.1	-139.3	-273.4	0.58	-0.52	-2.43	
3,057.0	5.56	333.82	3,028.9	2,046.1	288.6	-143.4	-281.6	0.51	-0.49	-1.11	
3,150.0	5.09	330.06	3,121.5	1,953.5	296.2	-147.4	-289.1	0.63	-0.51	-4.04	

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-14HZ
Project:	WELD COUNTY (NAD 83)	TDV Reference:	KB 20' @ 5075.0usft (PD 461)
Site:	SW SE SEC. 25 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5075.0usft (PD 461)
Well:	GRACIE 24-14HZ	North Reference:	True
Wellbore:	JOB # 2018-390-461	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)
3,242.0	4.27	343.81	3,213.1	1,861.9	303.0	-150.4	-295.7	1.50	-0.89	14.95
3,335.0	4.00	338.19	3,305.9	1,769.1	309.4	-152.6	-302.0	0.52	-0.29	-6.04
3,429.0	3.15	333.00	3,399.7	1,675.3	314.7	-155.0	-307.2	0.97	-0.90	-5.52
3,523.0	1.63	15.29	3,493.6	1,581.4	318.3	-155.8	-310.8	2.37	-1.62	44.99
3,617.0	1.17	6.08	3,587.6	1,487.4	320.5	-155.4	-313.0	0.54	-0.49	-9.80
3,711.0	0.84	353.84	3,681.6	1,393.4	322.2	-155.3	-314.7	0.42	-0.35	-13.02
3,804.0	0.90	348.17	3,774.6	1,300.4	323.6	-155.6	-316.0	0.11	0.06	-6.10
3,899.0	0.67	341.69	3,869.6	1,205.4	324.8	-155.9	-317.3	0.26	-0.24	-6.82
3,992.0	0.42	9.10	3,962.6	1,112.4	325.7	-156.0	-318.1	0.38	-0.27	29.47
4,085.0	0.75	44.31	4,055.6	1,019.4	326.5	-155.5	-318.9	0.51	0.35	37.86
4,179.0	1.58	59.35	4,149.6	925.4	327.6	-154.0	-320.1	0.93	0.88	16.00
4,296.0	1.77	66.01	4,266.5	808.5	329.1	-150.9	-321.8	0.23	0.16	5.69
4,391.0	1.07	65.33	4,361.5	713.5	330.1	-148.8	-322.8	0.74	-0.74	-0.72
4,485.0	0.59	273.28	4,455.5	619.5	330.5	-148.5	-323.3	1.72	-0.51	-161.76
4,579.0	0.74	288.67	4,549.5	525.5	330.7	-149.5	-323.4	0.25	0.16	16.37
4,673.0	1.03	289.17	4,643.5	431.5	331.2	-150.9	-323.8	0.31	0.31	0.53
4,766.0	1.07	291.99	4,736.4	338.6	331.8	-152.5	-324.4	0.07	0.04	3.03
4,861.0	1.19	286.34	4,831.4	243.6	332.4	-154.3	-324.9	0.17	0.13	-5.95
4,955.0	0.93	274.42	4,925.4	149.6	332.7	-156.0	-325.1	0.36	-0.28	-12.68
5,049.0	1.02	258.09	5,019.4	55.6	332.6	-157.6	-325.0	0.31	0.10	-17.37
5,144.0	1.15	250.08	5,114.4	-39.4	332.1	-159.3	-324.4	0.21	0.14	-8.43
5,239.0	1.27	247.43	5,209.3	-134.3	331.4	-161.1	-323.6	0.14	0.13	-2.79
5,334.0	1.34	239.34	5,304.3	-229.3	330.4	-163.1	-322.5	0.21	0.07	-8.52
5,427.0	1.42	239.88	5,397.3	-322.3	329.3	-165.0	-321.3	0.09	0.09	0.58
5,521.0	1.31	240.43	5,491.3	-416.3	328.1	-166.9	-320.1	0.12	-0.12	0.59
5,617.0	1.29	245.03	5,587.2	-512.2	327.2	-168.9	-319.0	0.11	-0.02	4.79
5,711.0	1.44	238.30	5,681.2	-606.2	326.1	-170.8	-317.8	0.23	0.16	-7.16
5,805.0	1.39	226.95	5,775.2	-700.2	324.7	-172.7	-316.4	0.30	-0.05	-12.07
5,898.0	1.33	214.94	5,868.2	-793.2	323.0	-174.1	-314.6	0.31	-0.06	-12.91
5,992.0	1.66	200.32	5,962.1	-887.1	320.9	-175.2	-312.4	0.53	0.35	-15.55
6,086.0	2.60	207.05	6,056.1	-981.1	317.7	-176.7	-309.2	1.03	1.00	7.16
6,179.0	2.08	180.19	6,149.0	-1,074.0	314.1	-177.6	-305.6	1.29	-0.56	-28.88
6,272.0	0.80	160.60	6,242.0	-1,167.0	311.8	-177.4	-303.3	1.45	-1.38	-21.06
6,365.0	1.39	201.28	6,334.9	-1,259.9	310.2	-177.6	-301.6	1.01	0.63	43.74
6,459.0	1.52	212.31	6,428.9	-1,353.9	308.0	-178.7	-299.4	0.33	0.14	11.73
6,553.0	2.17	211.89	6,522.9	-1,447.9	305.5	-180.3	-296.8	0.69	0.69	-0.45
6,648.0	2.54	210.43	6,617.8	-1,542.8	302.1	-182.3	-293.4	0.39	0.39	-1.54
KOP										
6,730.0	4.92	208.75	6,699.6	-1,624.6	297.5	-184.9	-288.6	2.91	2.90	-2.05
6,742.0	5.27	208.63	6,711.6	-1,636.6	296.5	-185.4	-287.7	2.91	2.91	-0.99
6,837.0	13.93	201.09	6,805.1	-1,730.1	282.0	-191.7	-272.9	9.19	9.12	-7.94
6,929.0	21.56	199.52	6,892.7	-1,817.7	255.7	-201.3	-246.1	8.31	8.29	-1.71
7,024.0	27.12	191.69	6,979.2	-1,904.2	218.0	-211.5	-208.0	6.76	5.85	-8.24
7,119.0	33.00	175.15	7,061.6	-1,986.6	170.9	-213.7	-160.9	10.64	6.19	-17.41
7,214.0	33.66	164.41	7,141.0	-2,066.0	119.7	-204.5	-110.2	6.24	0.69	-11.31
7,308.0	37.94	168.44	7,217.2	-2,142.2	66.3	-191.7	-57.4	5.20	4.55	4.29
7,401.0	48.26	174.98	7,285.1	-2,210.1	3.5	-182.9	4.9	12.08	11.10	7.03
7,495.0	52.92	176.04	7,344.8	-2,269.8	-68.9	-177.2	77.0	5.03	4.96	1.13
7,590.0	60.21	176.58	7,397.1	-2,322.1	-147.9	-172.1	155.7	7.69	7.67	0.57
7,683.0	67.89	175.71	7,437.7	-2,362.7	-231.3	-166.5	238.7	8.30	8.26	-0.94
7,776.0	76.00	179.16	7,466.5	-2,391.5	-319.5	-162.6	326.7	9.41	8.72	3.71
HEEL:40.116576;-104.722878										
7,836.0	84.70	178.64	7,476.6	-2,401.6	-378.6	-161.5	385.7	14.53	14.51	-0.87

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-14HZ
Project:	WELD COUNTY (NAD 83)	TD Reference:	KB 20' @ 5075.0usft (PD 461)
Site:	SW SE SEC. 25 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5075.0usft (PD 461)
Well:	GRACIE 24-14HZ	North Reference:	True
Wellbore:	JOB # 2018-390-461	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)
7,869.0	89.49	178.36	7,478.3	-2,403.3	-411.6	-160.6	418.5	14.53	14.51	-0.85
7,961.0	89.02	179.27	7,479.5	-2,404.5	-503.5	-158.7	510.3	1.11	-0.51	0.99
8,056.0	87.80	177.66	7,482.1	-2,407.1	-598.5	-156.2	605.0	2.13	-1.28	-1.69
8,151.0	87.75	177.28	7,485.8	-2,410.8	-693.3	-152.0	699.6	0.40	-0.05	-0.40
8,245.0	87.78	176.27	7,489.4	-2,414.4	-787.1	-146.7	793.0	1.07	0.03	-1.07
~ CROSS 460' SETBACK HEEL (8312' MD)										
8,312.0	88.47	177.52	7,491.6	-2,416.6	-853.9	-143.1	859.6	2.13	1.03	1.86
8,338.0	88.74	178.00	7,492.3	-2,417.3	-879.9	-142.0	885.5	2.13	1.03	1.86
8,432.0	88.85	177.49	7,494.2	-2,419.2	-973.8	-138.3	979.2	0.55	0.12	-0.54
8,526.0	89.30	178.29	7,495.8	-2,420.8	-1,067.7	-134.9	1,072.8	0.98	0.48	0.85
8,621.0	89.69	178.01	7,496.6	-2,421.6	-1,162.7	-131.8	1,167.5	0.51	0.41	-0.29
8,715.0	89.87	177.98	7,497.0	-2,422.0	-1,256.6	-128.5	1,261.2	0.19	0.19	-0.03
8,809.0	90.35	178.18	7,496.8	-2,421.8	-1,350.6	-125.4	1,354.9	0.55	0.51	0.21
8,903.0	88.37	178.43	7,497.8	-2,422.8	-1,444.5	-122.6	1,448.6	2.12	-2.11	0.27
8,997.0	88.56	178.38	7,500.3	-2,425.3	-1,538.4	-120.0	1,542.3	0.21	0.20	-0.05
9,092.0	88.55	178.33	7,502.7	-2,427.7	-1,633.4	-117.3	1,637.0	0.05	-0.01	-0.05
9,185.0	89.16	178.04	7,504.6	-2,429.6	-1,726.3	-114.3	1,729.7	0.73	0.66	-0.31
9,280.0	88.92	178.07	7,506.2	-2,431.2	-1,821.2	-111.1	1,824.4	0.25	-0.25	0.03
9,374.0	90.78	178.07	7,506.4	-2,431.4	-1,915.2	-107.9	1,918.1	1.98	1.98	0.00
9,468.0	90.52	177.38	7,505.4	-2,430.4	-2,009.1	-104.2	2,011.8	0.78	-0.28	-0.73
9,562.0	91.04	177.20	7,504.1	-2,429.1	-2,103.0	-99.7	2,105.4	0.59	0.55	-0.19
9,655.0	90.05	177.05	7,503.2	-2,428.2	-2,195.9	-95.1	2,197.9	1.08	-1.06	-0.16
9,748.0	90.59	176.71	7,502.7	-2,427.7	-2,288.7	-90.0	2,290.4	0.69	0.58	-0.37
9,841.0	88.89	176.38	7,503.1	-2,428.1	-2,381.6	-84.4	2,382.9	1.86	-1.83	-0.35
9,935.0	89.05	175.63	7,504.8	-2,429.8	-2,475.3	-77.9	2,476.3	0.82	0.17	-0.80
10,029.0	90.22	177.35	7,505.4	-2,430.4	-2,569.1	-72.1	2,569.7	2.21	1.24	1.83
10,124.0	91.36	176.93	7,504.1	-2,429.1	-2,664.0	-67.4	2,664.3	1.28	1.20	-0.44
10,217.0	90.01	179.26	7,503.0	-2,428.0	-2,756.9	-64.3	2,757.0	2.90	-1.45	2.51
10,311.0	90.98	180.08	7,502.2	-2,427.2	-2,850.9	-63.7	2,850.8	1.35	1.03	0.87
10,405.0	89.60	179.54	7,501.7	-2,426.7	-2,944.9	-63.4	2,944.7	1.58	-1.47	-0.57
10,499.0	89.87	179.06	7,502.1	-2,427.1	-3,038.9	-62.3	3,038.5	0.59	0.29	-0.51
10,592.0	91.04	180.15	7,501.4	-2,426.4	-3,131.9	-61.6	3,131.4	1.72	1.26	1.17
10,686.0	91.01	180.81	7,499.7	-2,424.7	-3,225.9	-62.4	3,225.3	0.70	-0.03	0.70
10,779.0	90.05	179.73	7,498.8	-2,423.8	-3,318.9	-62.9	3,318.2	1.55	-1.03	-1.16
10,872.0	89.29	180.24	7,499.4	-2,424.4	-3,411.9	-62.8	3,411.1	0.98	-0.82	0.55
10,966.0	89.74	180.50	7,500.2	-2,425.2	-3,505.9	-63.4	3,505.1	0.55	0.48	0.28
11,060.0	88.02	181.94	7,502.0	-2,427.0	-3,599.8	-65.4	3,599.0	2.39	-1.83	1.53
11,154.0	88.52	182.12	7,504.9	-2,429.9	-3,693.7	-68.8	3,692.9	0.57	0.53	0.19
11,250.0	89.63	182.44	7,506.4	-2,431.4	-3,789.6	-72.6	3,788.9	1.20	1.16	0.33
11,344.0	89.78	182.02	7,506.9	-2,431.9	-3,883.6	-76.2	3,882.9	0.47	0.16	-0.45
~ CROSS 460' SETBACK TOE (11350' MD)										
11,350.0	89.78	182.02	7,506.9	-2,431.9	-3,889.6	-76.5	3,888.9	0.00	0.00	0.00
11,437.0	89.78	182.03	7,507.2	-2,432.2	-3,976.5	-79.5	3,975.9	0.01	0.00	0.01
11,532.0	90.18	182.13	7,507.3	-2,432.3	-4,071.4	-83.0	4,070.9	0.43	0.42	0.11
11,626.0	90.32	181.54	7,506.9	-2,431.9	-4,165.4	-86.0	4,164.9	0.65	0.15	-0.63
11,722.0	89.94	181.34	7,506.6	-2,431.6	-4,261.4	-88.4	4,260.9	0.45	-0.40	-0.21
11,816.0	89.66	181.24	7,507.0	-2,432.0	-4,355.3	-90.5	4,354.9	0.32	-0.30	-0.11
11,909.0	90.54	184.21	7,506.8	-2,431.8	-4,448.2	-94.9	4,447.8	3.33	0.95	3.19
12,004.0	90.67	184.20	7,505.8	-2,430.8	-4,543.0	-101.9	4,542.8	0.14	0.14	-0.01
12,097.0	91.10	184.07	7,504.4	-2,429.4	-4,635.7	-108.6	4,635.8	0.48	0.46	-0.14
12,191.0	91.19	183.58	7,502.5	-2,427.5	-4,729.5	-114.9	4,729.7	0.53	0.10	-0.52
12,285.0	92.06	184.11	7,499.8	-2,424.8	-4,823.2	-121.2	4,823.7	1.08	0.93	0.56
12,380.0	92.61	184.23	7,496.0	-2,421.0	-4,917.9	-128.1	4,918.6	0.59	0.58	0.13

Survey Report



Company:	ANADARKO PETROLEUM CORP	Local Co-ordinate Reference:	Well GRACIE 24-14HZ
Project:	WELD COUNTY (NAD 83)	TVD Reference:	KB 20' @ 5075.0usft (PD 461)
Site:	SW SE SEC. 25 T2N R66W 6th P.M.	MD Reference:	KB 20' @ 5075.0usft (PD 461)
Well:	GRACIE 24-14HZ	North Reference:	True
Wellbore:	JOB # 2018-390-461	Survey Calculation Method:	Minimum Curvature
Design:	FINAL SURVEYS	Database:	EOG RESOURCES

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)
12,474.0	90.43	182.57	7,493.5	-2,418.5	-5,011.7	-133.7	5,012.5	2.91	-2.32	-1.77
LAST SURVEY JULY 20, 2018										
12,569.0	91.03	182.71	7,492.3	-2,417.3	-5,106.6	-138.0	5,107.5	0.65	0.63	0.15
PROJECTION TO TD:40.103345;-104.722809										
12,661.0	91.03	182.71	7,490.6	-2,415.6	-5,198.5	-142.4	5,199.5	0.00	0.00	0.00

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
KOP - GRACIE 24-14HZ - hit/miss target - Shape	0.00	0.00	6,752.3	274.1	-174.1	14,569,956.98	1,717,878.36	40° 7' 6.123 N	104° 43' 22.521 W
- survey misses target center by 22.3usft at 6784.9usft MD (6754.1 TVD, 291.7 N, -187.7 E)									
- Point									
KOP - GRACIE 24-14HZ - hit/miss target - Shape	0.00	0.00	6,650.4	375.7	-177.4	14,570,058.52	1,717,874.77	40° 7' 7.127 N	104° 43' 22.563 W
- survey misses target center by 75.2usft at 6676.2usft MD (6646.0 TVD, 300.9 N, -183.0 E)									
- Point									
HEEL - GRACIE 24-14H - hit/miss target - Shape	0.00	0.00	7,470.0	-435.8	-151.6	14,569,247.38	1,717,903.12	40° 6' 59.107 N	104° 43' 22.231 W
- survey misses target center by 11.9usft at 7893.4usft MD (7478.5 TVD, -435.9 N, -160.0 E)									
- Point									
BHL - GRACIE 24-14HZ - hit/miss target - Shape	0.00	0.00	7,508.0	-5,198.5	-142.7	14,564,486.68	1,717,926.89	40° 6' 12.042 N	104° 43' 22.116 W
- survey misses target center by 17.4usft at 12660.7usft MD (7490.6 TVD, -5198.2 N, -142.4 E)									
- Point									
HEEL - GRACIE 24-14H - hit/miss target - Shape	0.00	0.00	7,469.0	-435.8	-151.6	14,569,247.38	1,717,903.12	40° 6' 59.107 N	104° 43' 22.231 W
- survey misses target center by 12.7usft at 7893.3usft MD (7478.5 TVD, -435.9 N, -160.0 E)									
- Point									
BHL - GRACIE 24-14HZ - hit/miss target - Shape	0.00	0.00	7,508.0	-5,198.5	-142.7	14,564,486.68	1,717,926.89	40° 6' 12.042 N	104° 43' 22.116 W
- survey misses target center by 17.4usft at 12660.7usft MD (7490.6 TVD, -5198.2 N, -142.4 E)									
- Point									

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
1,808.0	1,794.9	108.9	-91.0	TIE ON TO SURFACE SURVEY
6,730.0	6,699.6	297.5	-184.9	KOP
7,836.0	7,476.6	-378.6	-161.5	HEEL:40.116576;-104.722878
8,312.0	7,491.6	-853.9	-143.1	~ CROSS 460' SETBACK HEEL (8312' MD)
11,350.0	7,506.9	-3,889.6	-76.5	~ CROSS 460' SETBACK TOE (11350' MD)
12,569.0	7,492.3	-5,106.6	-138.0	LAST SURVEY JULY 20, 2018
12,661.0	7,490.6	-5,198.5	-142.4	PROJECTION TO TD:40.103345;-104.722809

Checked By: _____ Approved By: _____ Date: _____