



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	13-Jun-15	14-Jun-15			
Rig Bit Number	2	3			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (MD, ft)	637.00	6,363.00			
Log End Depth (MD, ft)	6,363.00	7,206.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	12-Jun-15 09:00	13-Jun-15 12:00			
Drill/Wipe End Date and Time	13-Jun-15 04:00	13-Jun-15 22:30			
Min Inc (deg) @ Depth (MD, ft)	0.03 @ 5,599.00	16.22 @ 6,453.00			
Max Inc (deg) @ Depth (MD, ft)	10.03 @ 4,178.00	82.55 @ 7,153.00			
Bit TFA(in2) / Bit Type	0.91 / PDC	0.86 / PDC			
Flow Rate (gpm)	593.78	567.06			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.60 / 27.00	9.99 / 32.00			
Filtrate CL (ppm)	1,300.00	1,300.00			
pH / Fluid Loss (mptm)	8.50 / 0	9.70 / 0			
PV (cP) / YP (lhf2)	1 / 2.00	8 / 7.00			
% Solids / % Sand	1.50 / 0.00	0.20 / 0.10			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			

Max Tool Temp (degF) / Source	172.78 / PCM	172.78 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Adam Sampson	Adam Sampson			
Customer Representative	Dave Neilson	Dave Neilson			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11341324	11341324			
Insert Serial Number	11400838	11400838			
Date and Time Initialized	11-Jun-15 08:54	11-Jun-15 08:54			
Date and Time Read	14-Jun-15 04:38	14-Jun-15 04:45			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	52.00	53.00			
Software Version	6.33	6.33			
Sub Serial Number	11341324	11341324			
Sonde Serial Number	11638623	11638623			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	88.60	266.50			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	40.19	41.14			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341324	11341324			
Insert/Sonde Serial Number	12071280	12071280			

REMARKS

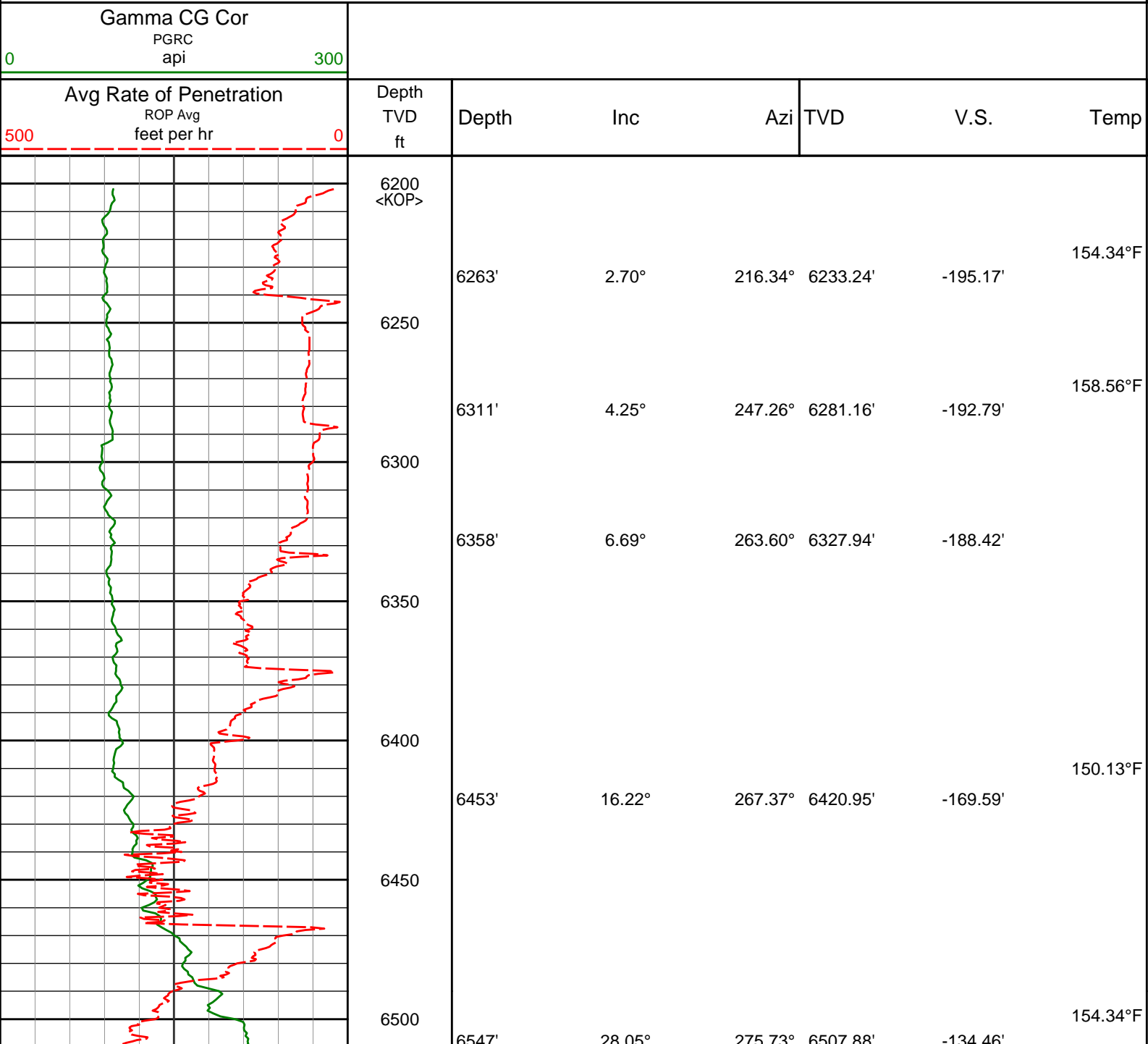
1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
 - All ROP in logs - 0.5 ft interval, 1.2 ft coercion distance.
 - Gamma in 2" (1:600) logs - 1 ft interval, 3 ft coercion distance.
 - Gamma in 5" (1:240) logs - 0.5 ft interval, 0.6 ft coercion distance.
5. INSITE version 8.1.10.

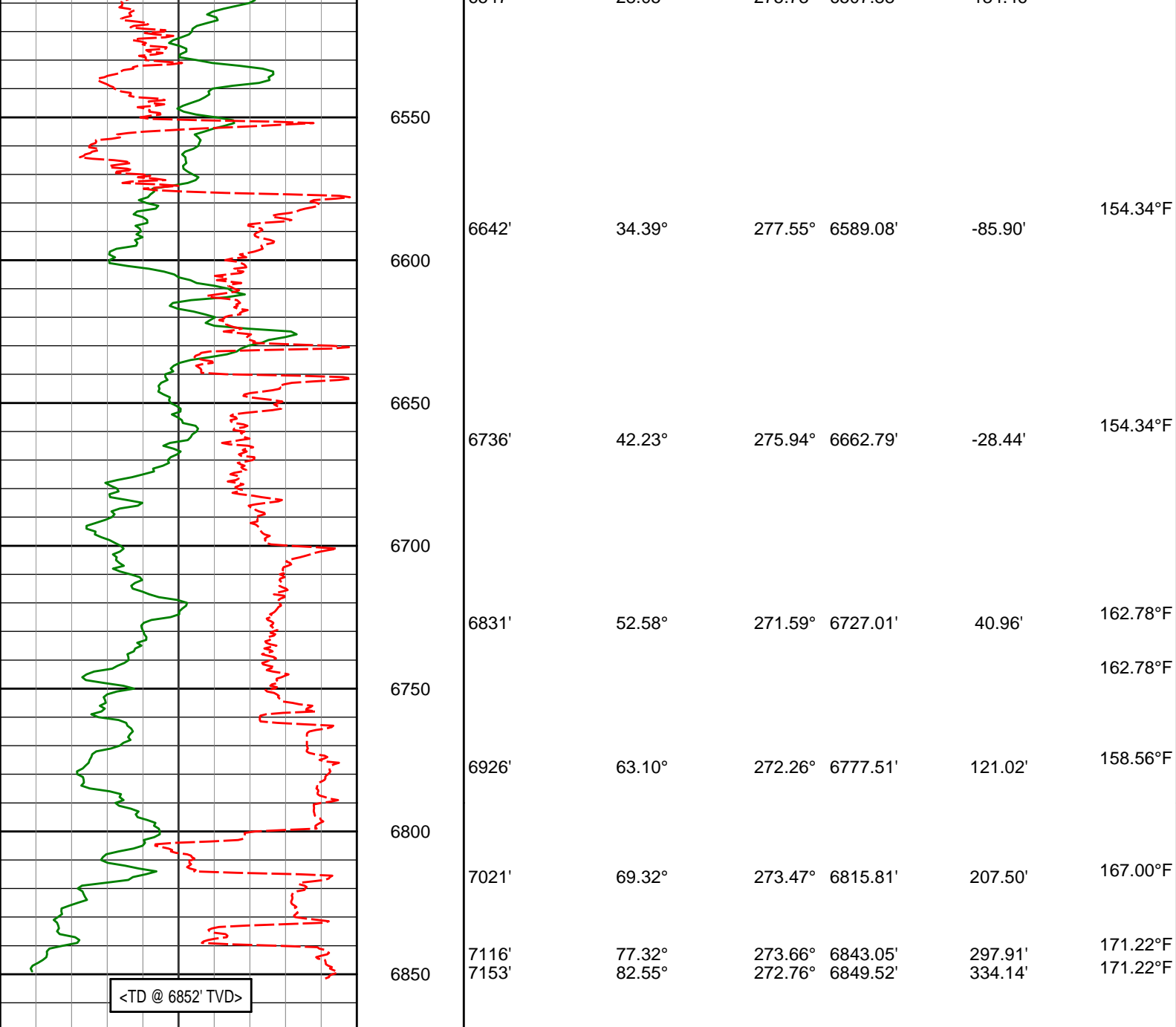
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TVD Detail 1:600 Scale

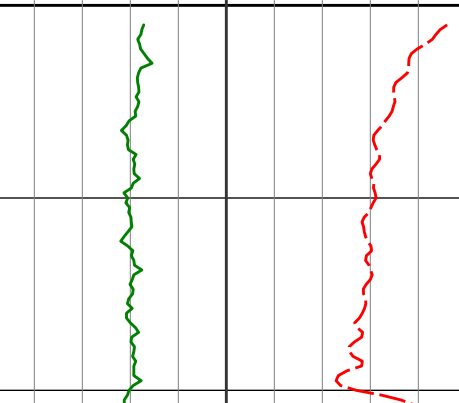
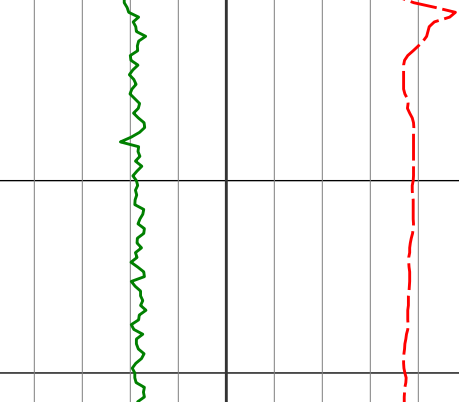
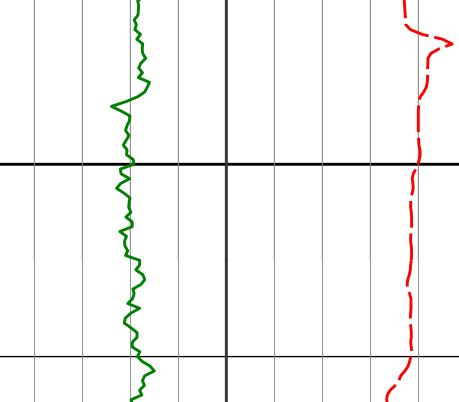
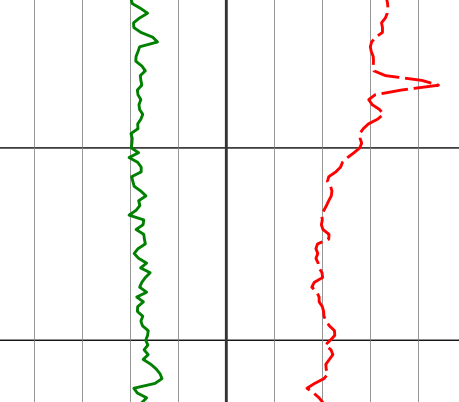


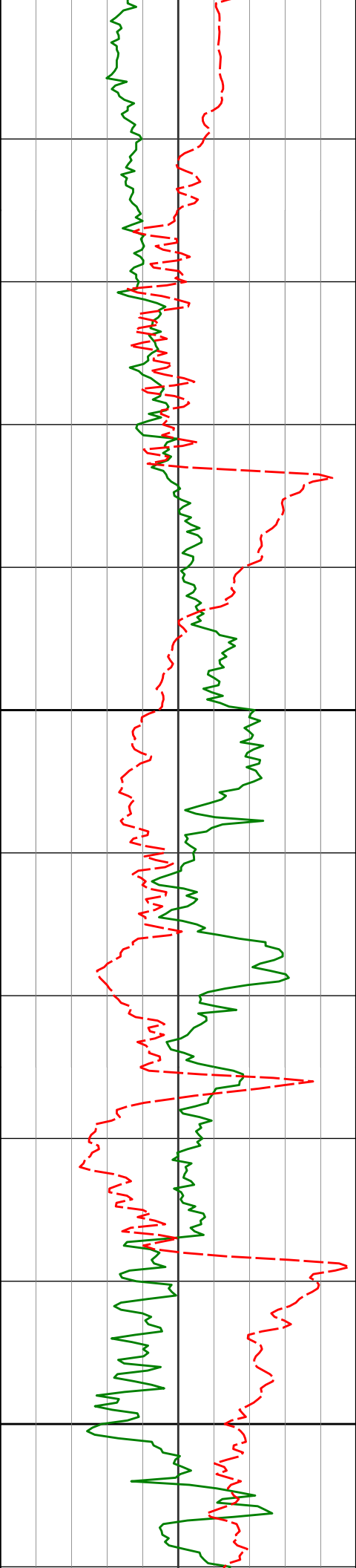


Avg Rate of Penetration ROP Avg feet per hr		Depth TVD ft	Depth	Inc	Azi	TVD	V.S.	Temp
5000								
Gamma CG Cor PGRC api								
0300								

TVD Detail 1:240 Scale

Gamma CG Cor PGRC api								
0		300						
Avg Rate of Penetration		Depth						

Avg Rate of Penetration						Depth	Inc	Azi	TVD	V.S.	Temp
ROP Avg feet per hr						TVD ft					
						6200 <KOP>					
						6263'	2.70°	216.34°	6233.24'	-195.17'	154.34°F
						6311'	4.25°	247.26°	6281.16'	-192.79'	158.56°F
						6358'	6.69°	263.60°	6327.94'	-188.42'	
						6400'					



6450

6500

6600

6453'

6547'

6642'

16.22°

28.05°

34.39°

267.37°

275.73°

277.55°

6420.95'

6507.88'

6589.08'

-169.59'

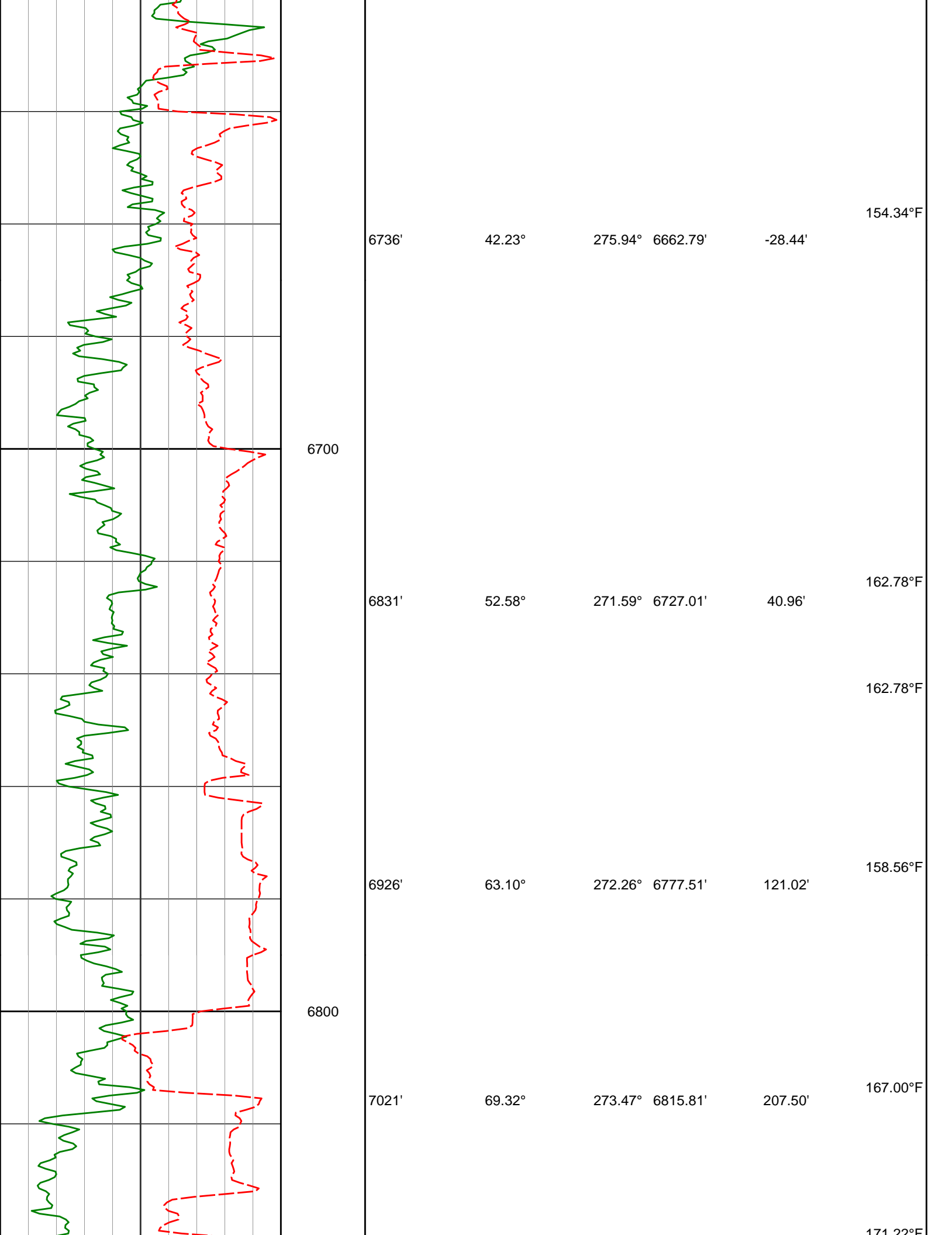
-134.46'

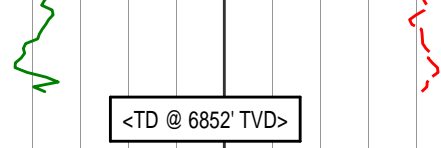
-85.90'

150.13°F

154.34°F

154.34°F



			7116'	77.32°	273.66°	6843.05'	297.91'	171.22°F
			7153'	82.55°	272.76°	6849.52'	334.14'	
Avg Rate of Penetration ROP Avg feet per hr			Depth TVD ft	Inc	Azi	TVD	V.S.	Temp
Gamma CG Cor PGRC api								

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
 Wells Ranch AA11-654
 Wattenberg
 Weld Colorado
 USA
 CA-XX-0902308243

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
300.00	0.06	276.43	300.00	0.02 N	0.16 W	0.16	0.02
637.00	0.12	276.43	637.00	0.08 N	0.68 W	0.68	0.02
729.00	0.14	276.43	729.00	0.10 N	0.89 W	0.88	0.02
824.00	0.04	91.62	824.00	0.11 N	0.97 W	0.96	0.19
1014.00	0.34	198.51	1014.00	0.43 S	1.07 W	1.09	0.19
1108.00	0.18	190.15	1108.00	0.84 S	1.19 W	1.22	0.17
1200.00	0.35	259.00	1200.00	1.04 S	1.49 W	1.54	0.36
1383.00	0.44	199.03	1382.99	1.81 S	2.27 W	2.35	0.22
1566.00	0.11	249.29	1565.99	2.54 S	2.67 W	2.78	0.21
1657.00	0.42	258.06	1656.99	2.64 S	3.07 W	3.19	0.34
1748.00	0.22	151.92	1747.99	2.86 S	3.32 W	3.45	0.57
1840.00	0.15	206.12	1839.99	3.13 S	3.29 W	3.43	0.19
1932.00	0.59	191.18	1931.99	3.70 S	3.44 W	3.60	0.48
2023.00	2.35	144.68	2022.95	5.68 S	2.45 W	2.70	2.19
2115.00	4.41	155.12	2114.79	10.42 S	0.13 E	0.35	2.32
2206.00	6.47	159.97	2205.38	18.41 S	3.35 E	-2.51	2.32
2297.00	9.04	159.10	2295.54	29.90 S	7.66 E	-6.29	2.83
2389.00	8.30	154.90	2386.49	42.67 S	13.05 E	-11.10	1.06
2481.00	9.31	155.29	2477.40	55.44 S	18.98 E	-16.44	1.11
2573.00	8.60	149.08	2568.28	68.10 S	25.63 E	-22.50	1.30
2665.00	9.19	146.78	2659.17	80.15 S	33.19 E	-29.50	0.75
2757.00	8.97	144.28	2750.02	92.12 S	41.40 E	-37.16	0.49
2851.00	9.23	139.39	2842.84	103.80 S	50.58 E	-45.81	0.87
2946.00	8.76	136.16	2936.67	114.80 S	60.55 E	-55.26	0.72
3040.00	9.06	137.24	3029.54	125.40 S	70.54 E	-64.75	0.37
3135.00	9.75	147.54	3123.27	137.68 S	79.93 E	-73.58	1.91
3230.00	9.38	144.06	3216.95	150.73 S	88.79 E	-81.84	0.72
3325.00	9.47	139.70	3310.67	162.95 S	98.39 E	-90.86	0.76
3420.00	9.15	135.16	3404.42	174.27 S	108.77 E	-100.72	0.84
3515.00	7.95	145.00	3498.36	185.00 S	117.86 E	-109.31	1.99
3609.00	7.73	136.40	3591.49	194.91 S	125.95 E	-116.95	1.27
3704.00	8.23	137.22	3685.57	204.53 S	134.98 E	-125.53	0.54
3894.00	8.99	153.10	3873.45	227.75 S	150.94 E	-140.41	1.31
3988.00	9.52	151.47	3966.23	241.13 S	157.97 E	-146.83	0.64
4083.00	9.51	149.99	4059.92	254.83 S	165.65 E	-153.88	0.26
4178.00	10.03	150.83	4153.54	268.85 S	173.61 E	-161.19	0.56
4272.00	8.02	150.80	4246.38	281.72 S	180.80 E	-167.78	2.14
4367.00	7.86	149.20	4340.46	293.09 S	187.36 E	-173.82	0.28
4462.00	6.76	153.83	4434.69	303.69 S	193.15 E	-179.12	1.32

4557.00	7.07	156.71	4529.00	314.08 S	197.93 E	-183.42	0.49
4651.00	5.41	154.32	4622.44	323.38 S	202.14 E	-187.20	1.79
4746.00	5.22	151.49	4717.03	331.21 S	206.14 E	-190.84	0.34
4841.00	3.48	150.83	4811.75	337.53 S	209.61 E	-194.02	1.83
4936.00	2.32	158.21	4906.63	341.83 S	211.72 E	-195.94	1.28
5031.00	2.12	160.54	5001.56	345.27 S	213.02 E	-197.08	0.23
5125.00	2.19	157.09	5095.49	348.56 S	214.30 E	-198.21	0.16
5220.00	1.90	156.71	5190.43	351.68 S	215.63 E	-199.39	0.30
5315.00	0.58	171.58	5285.41	353.61 S	216.33 E	-200.00	1.42
5410.00	0.35	102.75	5380.41	354.15 S	216.68 E	-200.33	0.59
5505.00	0.41	145.62	5475.41	354.49 S	217.15 E	-200.79	0.30
5599.00	0.03	69.37	5569.40	354.75 S	217.37 E	-200.99	0.42
5694.00	0.55	169.39	5664.40	355.19 S	217.47 E	-201.07	0.58
5789.00	0.51	204.26	5759.40	356.02 S	217.38 E	-200.94	0.34
5884.00	0.65	245.30	5854.39	356.64 S	216.71 E	-200.25	0.45
5979.00	1.30	223.94	5949.38	357.64 S	215.47 E	-198.97	0.77
6073.00	1.66	219.90	6043.35	359.45 S	213.86 E	-197.27	0.40
6168.00	1.75	172.54	6138.31	361.95 S	213.16 E	-196.46	1.45
6263.00	2.70	216.34	6233.24	365.19 S	212.02 E	-195.17	1.98
6311.00	4.25	247.26	6281.16	366.79 S	209.71 E	-192.79	4.96
6358.00	6.69	263.60	6327.94	367.77 S	205.38 E	-188.42	6.11
6453.00	16.22	267.37	6420.95	369.00 S	186.59 E	-169.59	10.05
6547.00	28.05	275.73	6507.88	367.39 S	151.35 E	-134.46	13.00
6642.00	34.39	277.55	6589.08	361.63 S	102.47 E	-85.90	6.74
6736.00	42.23	275.94	6662.79	354.86 S	44.65 E	-28.44	8.41
6831.00	52.58	271.59	6727.01	350.50 S	25.03 W	40.96	11.40
6926.00	63.10	272.26	6777.51	347.77 S	105.29 W	121.02	11.09
7021.00	69.32	273.47	6815.81	343.40 S	192.07 W	207.50	6.65
7116.00	77.32	273.66	6843.05	337.74 S	282.82 W	297.91	8.43
7153.00	82.55	272.76	6849.52	335.70 S	319.18 W	334.14	14.32

CALCULATION BASED ON MINIMUM CURVATURE METHOD

**SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT**

**VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 267.39 DEGREES (GRID)
A TOTAL CORRECTION OF 7.38 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7153.00 FEET
IS 463.22 FEET ALONG 223.55 DEGREES (GRID)**

Surveys at 300 ft and 637 ft were interpolated from first survey at 729 ft per Noble Energy.