

PCGK - Pressure Case Gamma

1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	02-Jun-14	03-Jun-14			
Rig Bit Number	2	3			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (TVD, ft)	857.99	6,004.55			
Log End Depth (TVD, ft)	6,004.55	6,683.22			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	01-Jun-14 13:45	02-Jun-14 18:10			
Drill/Wipe End Date and Time	02-Jun-14 06:30	03-Jun-14 04:50			
Min Inc (deg) @ Depth (TVD, ft)	0.14 @ 5,945.55	1.27 @ 6,062.54			
Max Inc (deg) @ Depth (TVD, ft)	14.05 @ 2,974.57	82.83 @ 6,679.54			
Bit TFA(in2) / Bit Type	0.91 / PDC	0.98 / PDC			
Flow Rate (gpm)	556.00	554.00			
Max AV (fpm) / CV (fpm) @ MWD	462.9 / 462.9	436.8 / 436.8			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.60 / 26.00	10.50 / 38.00			
Filtrate CL (ppm)	2,300.00	1,800.00			
pH / Fluid Loss (mptm)	10.20 / N/A	9.90 / N/A			
PV (cP) / YP (lbf2)	2 / 3.00	12 / 10.00			
% Solids / % Sand	1.1 / .01	11.9 / .05			
% 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 (in F) / S	122.00 / PCM	122.00 / PCM			

Max Tool Temp (degF) / Source	163.20 / PCM	163.20 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Robert Ley	Robert Ley			
Customer Representative	Jeremy Stolz	Jeremy Stolz			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11342299	11342299			
Insert Serial Number	11400989	11400989			
Date and Time Initialized	31-May-14 19:25	01-Jan-70 00:00			
Date and Time Read	03-Jun-14 10:59	03-Jun-14 10:49			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	59.00	58.00			
Software Version	6.21	6.21			
Sub Serial Number	11342299	11342299			
Sonde Serial Number	11833224	11833224			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	6.47	73.27			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	51.43	50.62			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11342299	11342299			
Insert/Sonde Serial Number	12071509	12071509			

REMARKS

1. All depths are true vertical depths and are calibrated to the driller' pipe tally and are measured from the 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.
4. The Following smoothing parameters have been applied to the data"

PGXR (Gamma Ray):

Interval Resolution: 0.5 feet

Coercion Distance: 0.6 feet

Gap Fill: 3.0 feet

ROPA (Rate of Penetration):

Interval Resolution: 0.5 feet

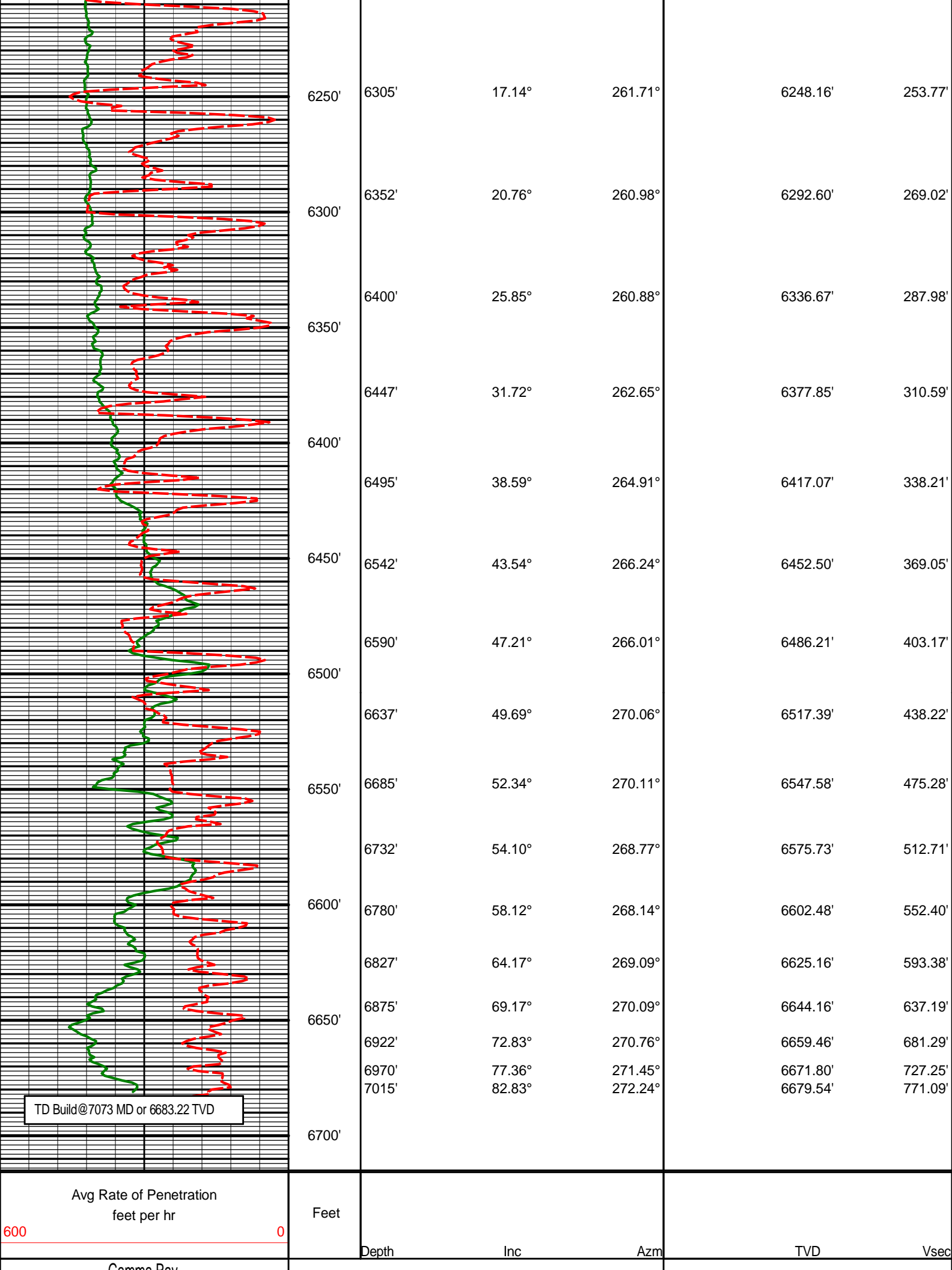
Coercion Distance: 1.2 feet

WARRANTY

HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS

TVD Detail Log 1:600

Gamma Ray (PGXC) (Api)							
0	300						
Avg Rate of Penetration feet per hr		Feet					
600	0		Depth	Inc	Azm	TVD	
						Vsec	
		5950'	5999'	0.14°	287.15°	5945.55'	220.34'
		6000'					
PGXC		Run 200					
ROPA							
		6050'					
		KOP	6116'	1.27°	284.68°	6062.54'	221.68'
		6100'					
			6163'	6.15°	272.28°	6109.43'	224.66'
		6150'					
			6211'	9.86°	265.04°	6156.95'	231.31'
		6200'					
			6258'	14.19°	260.66°	6202.91'	241.09'



Garima Ray (PGXC) (Api)	300
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HALLIBURTON

TVD Detail Log 1:240

Gamma Ray (PGXC) (Api)	0	300
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Avg Rate of Penetration feet per hr	
600	0

Feet

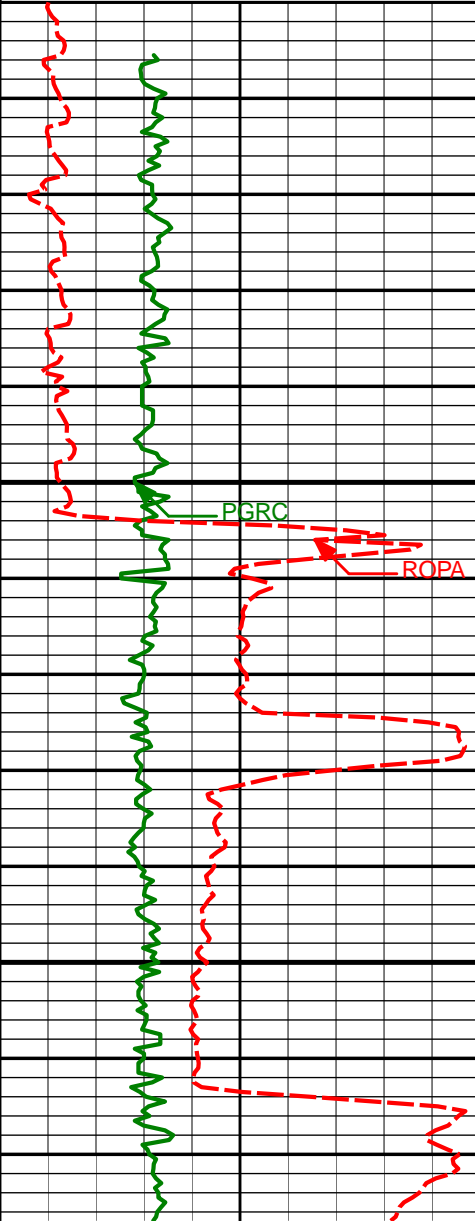
Depth Inc Azm

Inc Azm

Azm

TVD Vsec

Vsec



Run 200

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6050'

KOP

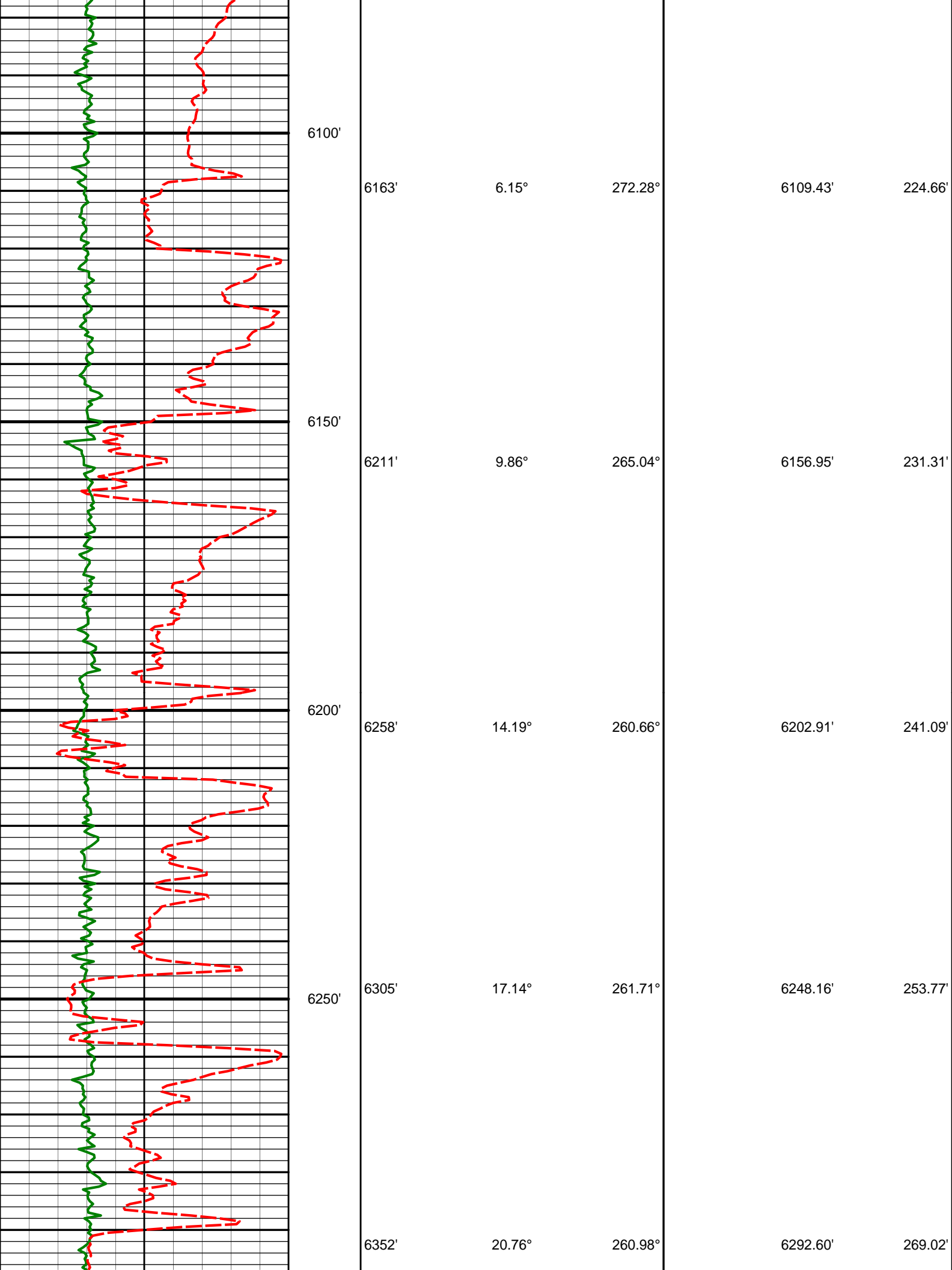
6116'	1.27°	284.68°
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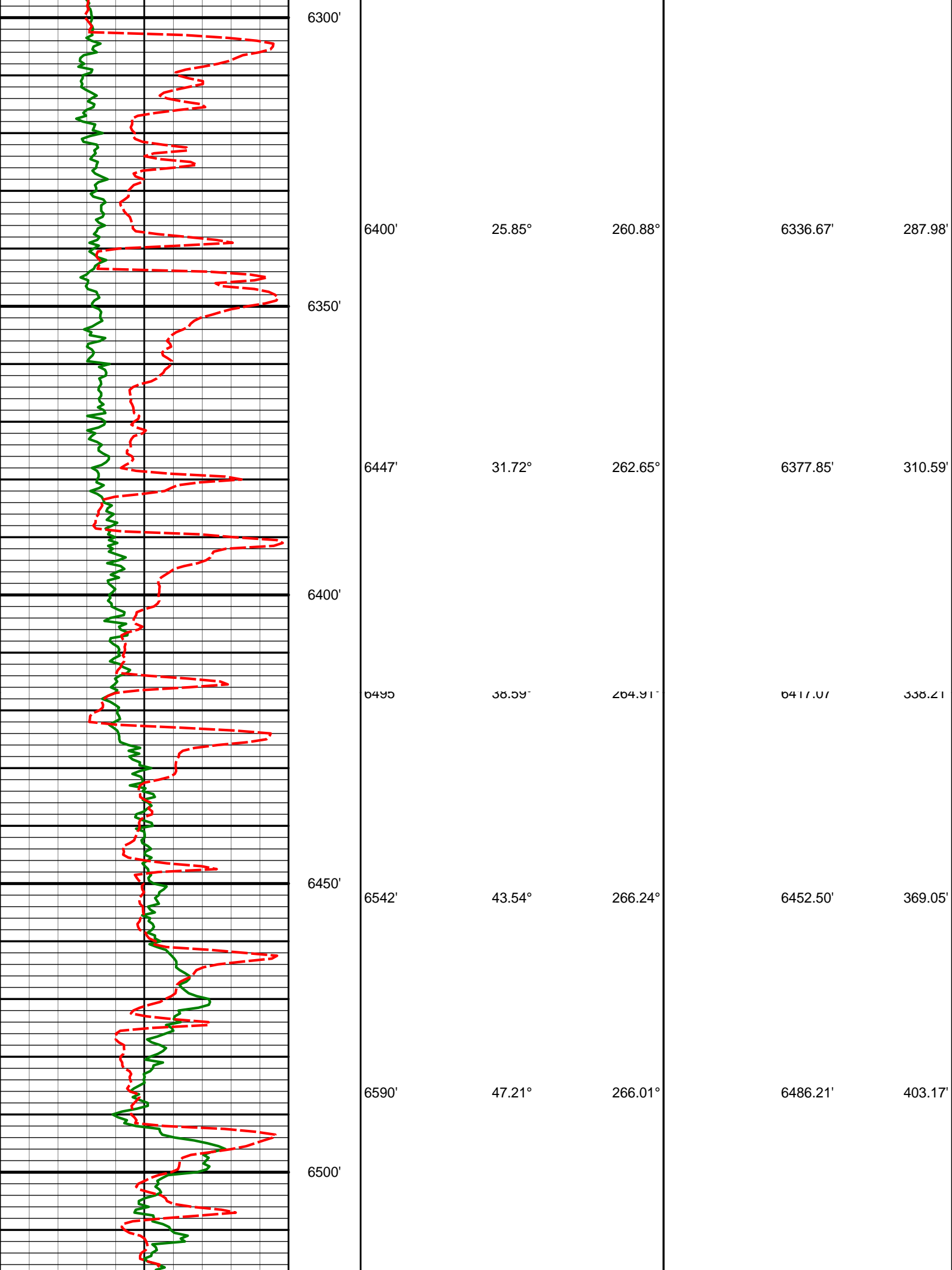
1.27° 284.68°

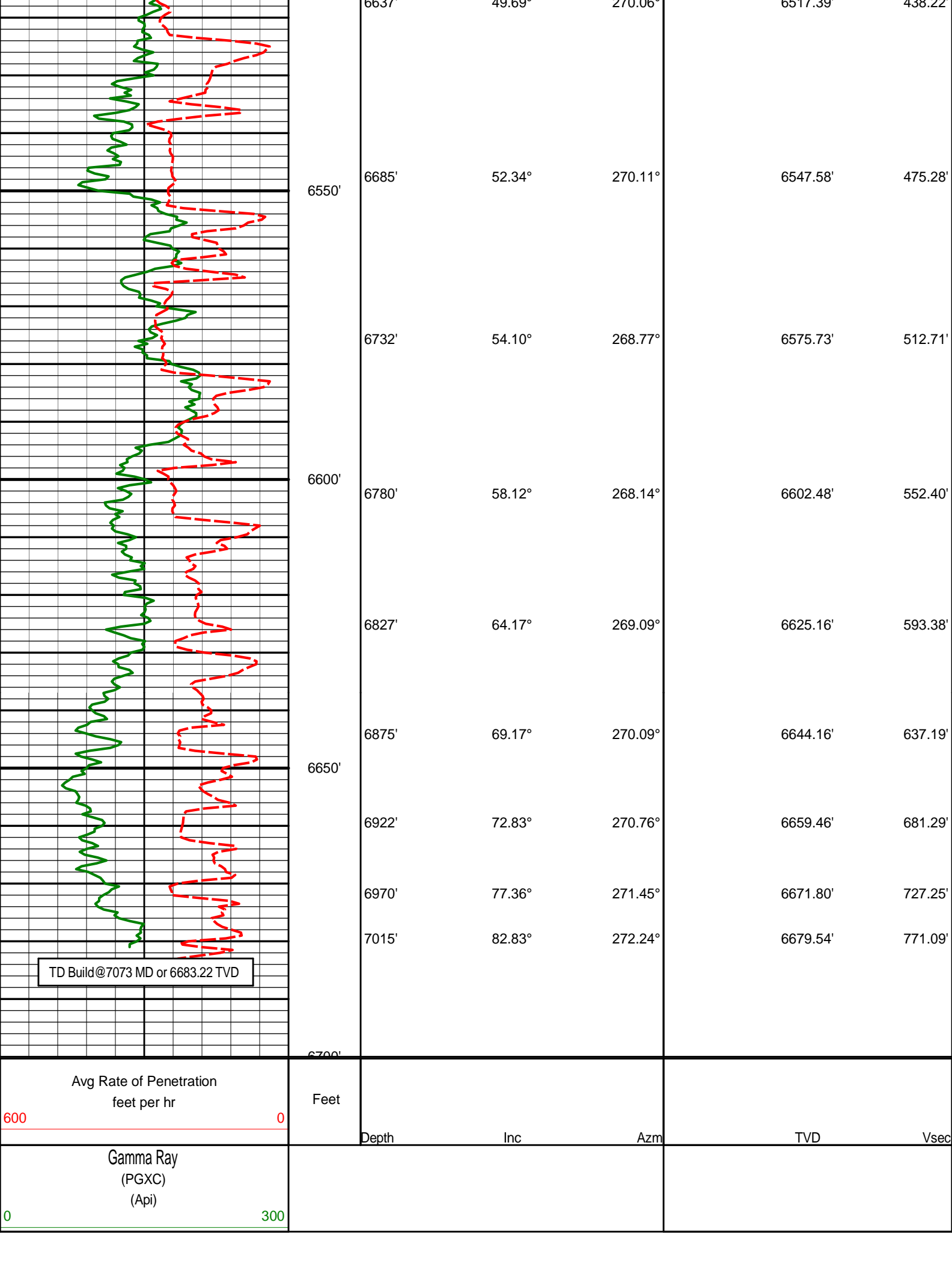
284.68°

6062.54'	221.68'
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221.68'







DIRECTIONAL SURVEY REPORT

Noble Energy
NCLP AA07-69HNA
Wattenberg
Weld Colorado
USA
CA-XX-0901286745

<i>Measured Depth (feet)</i>	<i>Inclination (degrees)</i>	<i>Direction (degrees)</i>	<i>Vertical Depth (feet)</i>	<i>Latitude (feet)</i>	<i>Departure (feet)</i>	<i>Vertical Section (feet)</i>	<i>Dogleg (deg/100ft)</i>
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
250.00	0.20	68.25	250.00	0.16 N	0.41 E	-0.42	0.08
500.00	0.20	38.25	500.00	0.67 N	1.08 E	-1.15	0.04
750.00	0.70	257.45	749.99	0.68 N	0.14 W	0.06	0.35
840.00	0.50	276.45	839.99	0.60 N	1.07 W	0.99	0.31
921.00	0.15	252.65	920.99	0.61 N	1.52 W	1.44	0.45
1014.00	0.44	255.22	1013.99	0.48 N	1.98 W	1.91	0.31
1107.00	0.35	246.09	1106.98	0.28 N	2.58 W	2.54	0.11
1200.00	1.92	201.03	1199.96	1.29 S	3.40 W	3.53	1.82
1293.00	1.90	202.88	1292.91	4.17 S	4.56 W	5.01	0.07
1386.00	2.09	203.65	1385.85	7.14 S	5.84 W	6.62	0.21
1479.00	1.80	204.96	1478.80	10.02 S	7.14 W	8.23	0.32
1573.00	1.86	207.01	1572.75	12.72 S	8.46 W	9.85	0.10
1668.00	3.50	169.91	1667.65	16.95 S	8.65 W	10.52	2.43
1763.00	5.34	164.44	1762.37	24.06 S	6.95 W	9.65	1.98
1857.00	6.60	180.22	1855.86	33.68 S	5.80 W	9.59	2.19
1952.00	8.09	180.02	1950.08	45.83 S	5.83 W	11.00	1.57
2047.00	8.61	177.71	2044.07	59.62 S	5.54 W	12.29	0.65
2142.00	9.21	181.99	2137.93	74.32 S	5.52 W	13.94	0.94
2237.00	9.10	181.67	2231.72	89.43 S	6.01 W	16.14	0.13
2331.00	10.22	191.02	2324.39	105.04 S	7.82 W	19.71	2.04
2426.00	10.58	193.18	2417.83	121.80 S	11.41 W	25.19	0.56
2521.00	11.03	189.53	2511.14	139.26 S	14.91 W	30.65	0.86
2615.00	11.02	185.06	2603.41	157.07 S	17.19 W	34.94	0.91
2710.00	11.21	184.09	2696.63	175.33 S	18.65 W	38.47	0.28
2804.00	10.97	186.47	2788.87	193.33 S	20.31 W	42.16	0.55
2899.00	11.86	188.66	2881.99	211.96 S	22.80 W	46.75	1.04
2994.00	14.05	190.43	2974.57	232.96 S	26.35 W	52.68	2.34
3088.00	11.90	186.76	3066.17	253.81 S	29.56 W	58.23	2.45
3183.00	11.67	189.66	3159.16	273.01 S	32.33 W	63.16	0.67
3278.00	9.42	203.64	3252.57	289.61 S	37.06 W	69.75	3.57
3373.00	7.95	192.56	3346.48	303.14 S	41.60 W	75.81	2.34
3468.00	7.52	213.88	3440.64	314.71 S	46.50 W	81.99	3.03
3563.00	7.38	220.23	3534.84	324.53 S	53.90 W	90.46	0.88
3658.00	9.21	212.87	3628.84	335.58 S	61.97 W	99.73	2.22
3752.00	10.74	209.00	3721.42	349.56 S	70.30 W	109.60	1.78
3847.00	12.26	202.00	3814.52	366.65 S	78.37 W	119.56	2.17
3942.00	13.88	203.47	3907.05	386.46 S	86.69 W	130.08	1.74
4037.00	13.44	198.32	3999.37	407.39 S	94.70 W	140.41	1.36
4132.00	12.44	193.04	4091.96	427.84 S	100.48 W	148.48	1.63
4226.00	9.96	197.43	4184.16	445.46 S	105.20 W	155.17	2.79
4321.00	9.28	191.77	4277.83	460.80 S	109.22 W	160.92	1.23
4416.00	8.85	182.93	4371.65	475.60 S	111.16 W	164.52	1.53
4511.00	9.24	191.13	4465.47	490.38 S	113.00 W	168.04	1.42
4606.00	11.27	198.22	4558.95	506.69 S	117.38 W	174.24	2.51
4700.00	9.68	188.59	4651.39	523.23 S	121.43 W	180.15	2.51
4795.00	7.50	207.98	4745.34	536.60 S	125.53 W	185.74	3.78
4889.00	5.99	203.02	4838.68	546.54 S	130.33 W	191.64	1.72
4984.00	6.36	206.98	4933.13	555.79 S	134.66 W	196.99	0.59
5079.00	7.78	203.30	5027.41	566.38 S	139.59 W	203.09	1.57
5174.00	6.77	202.90	5121.64	577.45 S	144.31 W	209.04	1.06
5268.00	6.17	198.30	5215.04	587.35 S	148.05 W	213.89	0.84
5363.00	3.51	187.58	5309.70	595.08 S	150.04 W	216.74	2.95
5458.00	1.73	180.13	5404.60	599.40 S	150.42 W	217.61	1.90
5552.00	0.94	206.07	5498.57	601.51 S	150.77 W	218.19	1.04
5647.00	0.90	208.30	5593.56	602.86 S	151.46 W	219.04	0.06
5742.00	0.34	237.57	5688.55	603.67 S	152.05 W	219.72	0.66
5837.00	0.31	337.80	5783.55	603.58 S	152.39 W	220.04	0.53
5999.00	0.14	287.15	5945.55	603.12 S	152.74 W	220.34	0.15

6116.00	1.27	284.68	6062.54	602.75 S	154.14 W	221.68	0.97
6163.00	6.15	272.28	6109.43	602.52 S	157.16 W	224.66	10.46
6211.00	9.86	265.04	6156.95	602.77 S	163.82 W	231.31	7.99
6258.00	14.19	260.66	6202.91	604.05 S	173.52 W	241.09	9.41
6305.00	17.14	261.71	6248.16	605.99 S	186.06 W	253.77	6.31
6352.00	20.76	260.98	6292.60	608.29 S	201.15 W	269.02	7.72
6400.00	25.85	260.88	6336.67	611.29 S	219.89 W	287.98	10.60
6447.00	31.72	262.65	6377.85	614.50 S	242.28 W	310.59	12.62
6495.00	38.59	264.91	6417.07	617.44 S	269.74 W	338.21	14.56
6542.00	43.54	266.24	6452.50	619.81 S	300.52 W	369.05	10.69
6590.00	47.21	266.01	6486.21	622.12 S	334.59 W	403.17	7.65
6637.00	49.69	270.06	6517.39	623.30 S	369.73 W	438.22	8.33
6685.00	52.34	270.11	6547.58	623.24 S	407.04 W	475.28	5.52
6732.00	54.10	268.77	6575.73	623.61 S	444.68 W	512.71	4.39
6780.00	58.12	268.14	6602.48	624.69 S	484.50 W	552.40	8.45
6827.00	64.17	269.09	6625.16	625.68 S	525.63 W	593.38	12.99
6875.00	69.17	270.09	6644.16	625.99 S	569.69 W	637.19	10.59
6922.00	72.83	270.76	6659.46	625.65 S	614.12 W	681.29	7.90
6970.00	77.36	271.45	6671.80	624.76 S	660.49 W	727.25	9.54
7015.00	82.83	272.24	6679.54	623.33 S	704.78 W	771.09	12.28

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 263.47 DEGREES (GRID)
A TOTAL CORRECTION OF 7.45 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7015.00 FEET
IS 940.88 FEET ALONG 228.51 DEGREES (GRID)**

Tie-In @ Surface

Surveys at 250 ft, 500, 750, and 840 ft were taken and provided by HP 322 while they were drilling the surface hole and have been converted from magnetic north to grid north.