



1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	24-Jul-12	26-Jul-12			
Rig Bit Number	100	200			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (TVD, ft)	947.00	6,518.33			
Log End Depth (TVD, ft)	6,518.33	6,979.65			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	22-Jul-12 00:00	24-Jul-12 13:30			
Drill/Wipe End Date and Time	24-Jul-12 01:00	25-Jul-12 19:00			
Min Inc (deg) @ Depth (TVD, ft)	.22 @ 1,571.99	12.64 @ 6,508.59			
Max Inc (deg) @ Depth (TVD, ft)	18.06 @ 3,139.34	83.32 @ 6,975.43			
Bit TFA(in2) / Bit Type	.75 / PDC	.75 / PDC			
Flow Rate (gpm)	565.00	558.00			
Max AV (fpm) / CV (fpm) @ MWD	477.1 / 477.1	441.5 / 441.5			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	9.50 / 35.00	10.25 / 41.00			
Filtrate CL (ppm)	450.00	600.00			
pH / Fluid Loss (mptm)	9.70 / N/A	9.60 / N/A			
PV (cP) / YP (lbf2)	7 / 9.00	12 / 11.00			
% Solids / % Sand	7.80 / 0.50	10.3 / .25			
% 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 (deg F) / S	170.70 / PDM	170.70 / PDM			

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	Robert Ley	Robert Ley			
Customer Representative	Jeremey Stolz	Jeremey Stolz			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11254959	11254959			
Insert Serial Number	10997274	10997274			
Date and Time Initialized	20-Jul-12 17:29	20-Jul-12 17:29			
Date and Time Read	26-Jul-12 00:57	26-Jul-12 00:50			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	54.00			
Software Version	6.21	6.21			
Sub Serial Number	11254959	11254959			
Sonde Serial Number	11638587	11638587			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	167.72	287.68			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	48.87	46.81			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11254959	11254959			
Insert/Sonde Serial Number	11293273	11293273			

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"

PGRC (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
Gap Fill: 3.0 feet

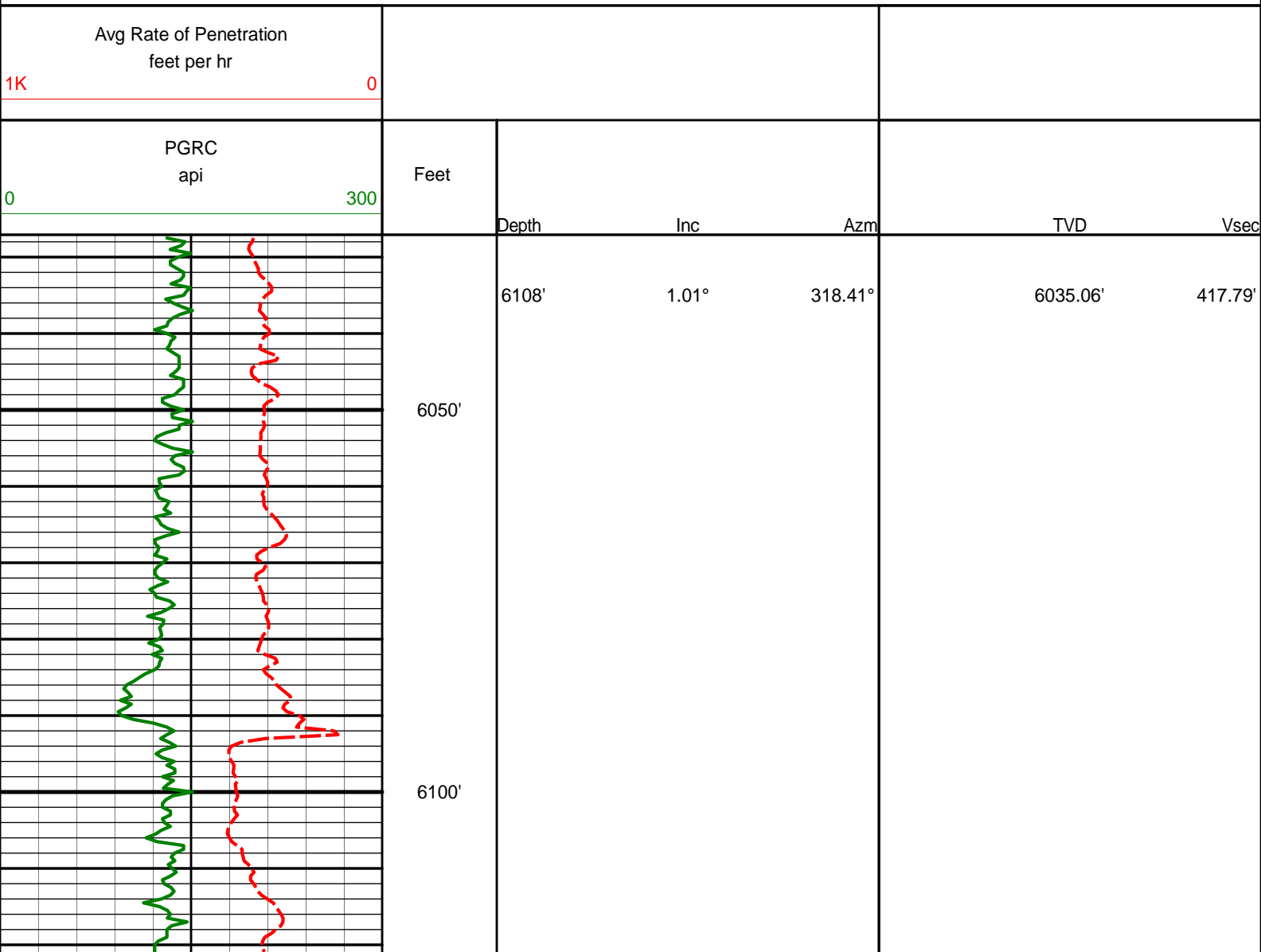
Insite Version 7.3.40 build 25

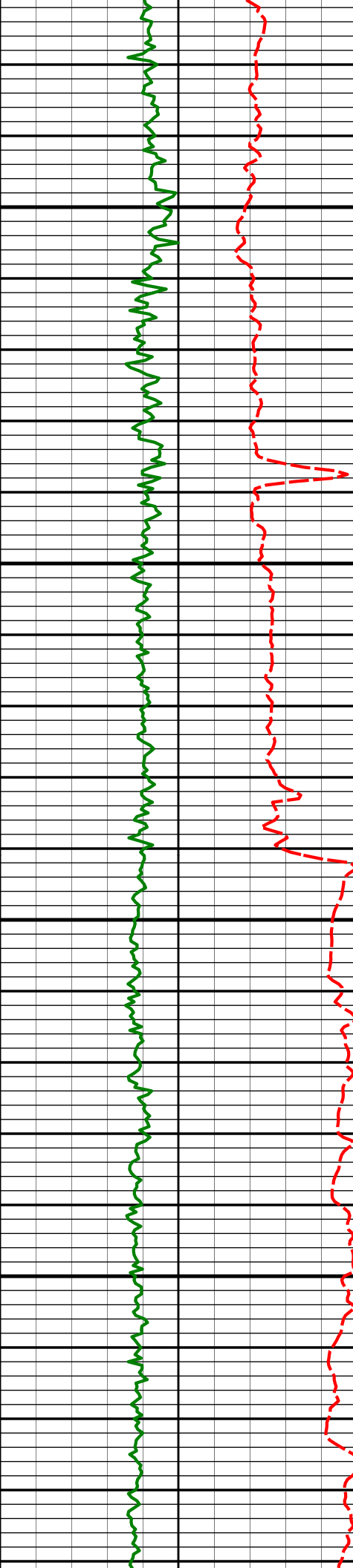
WARRANTY

HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

HALLIBURTON

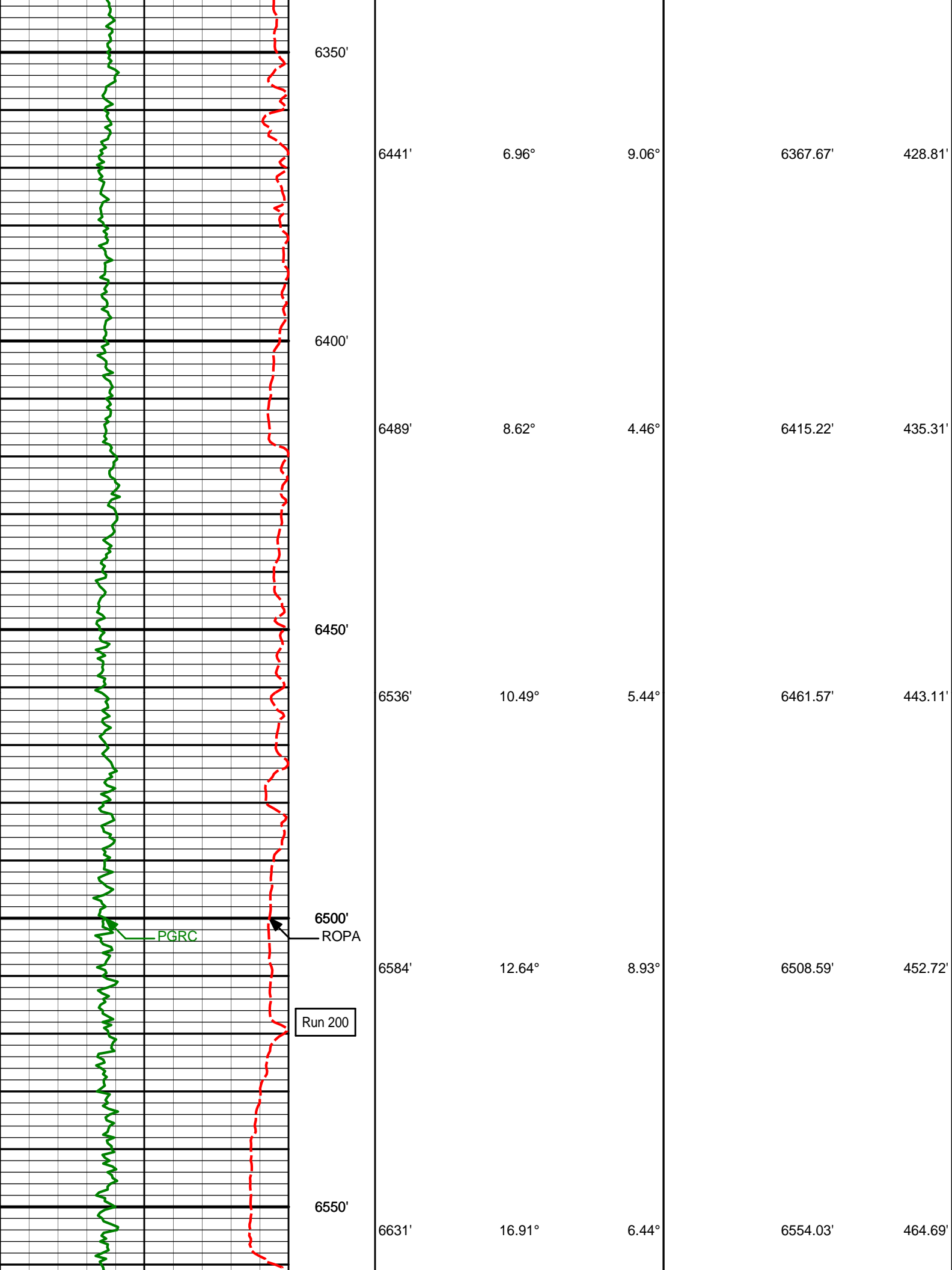
TVD Detail Log 1:240

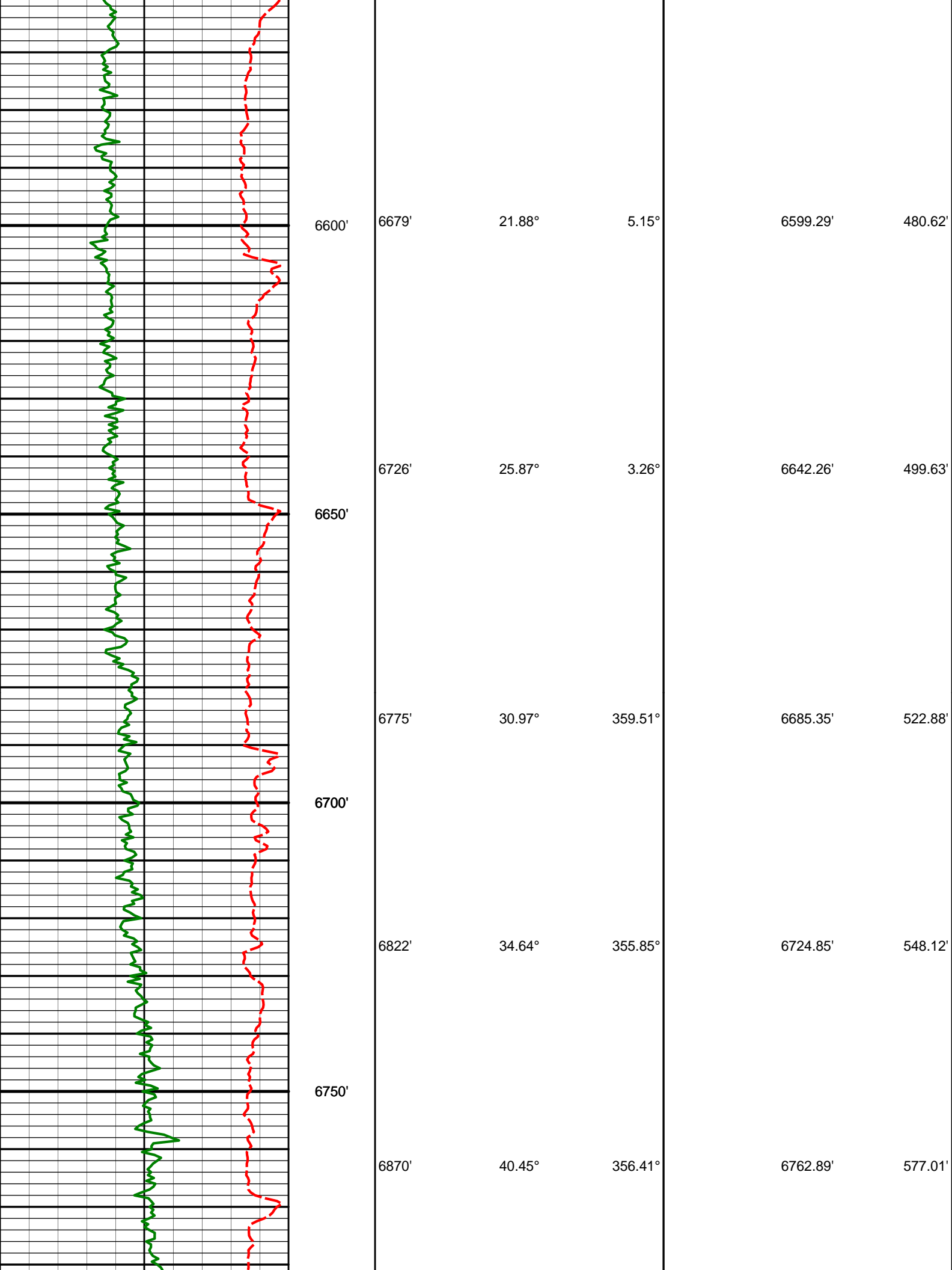


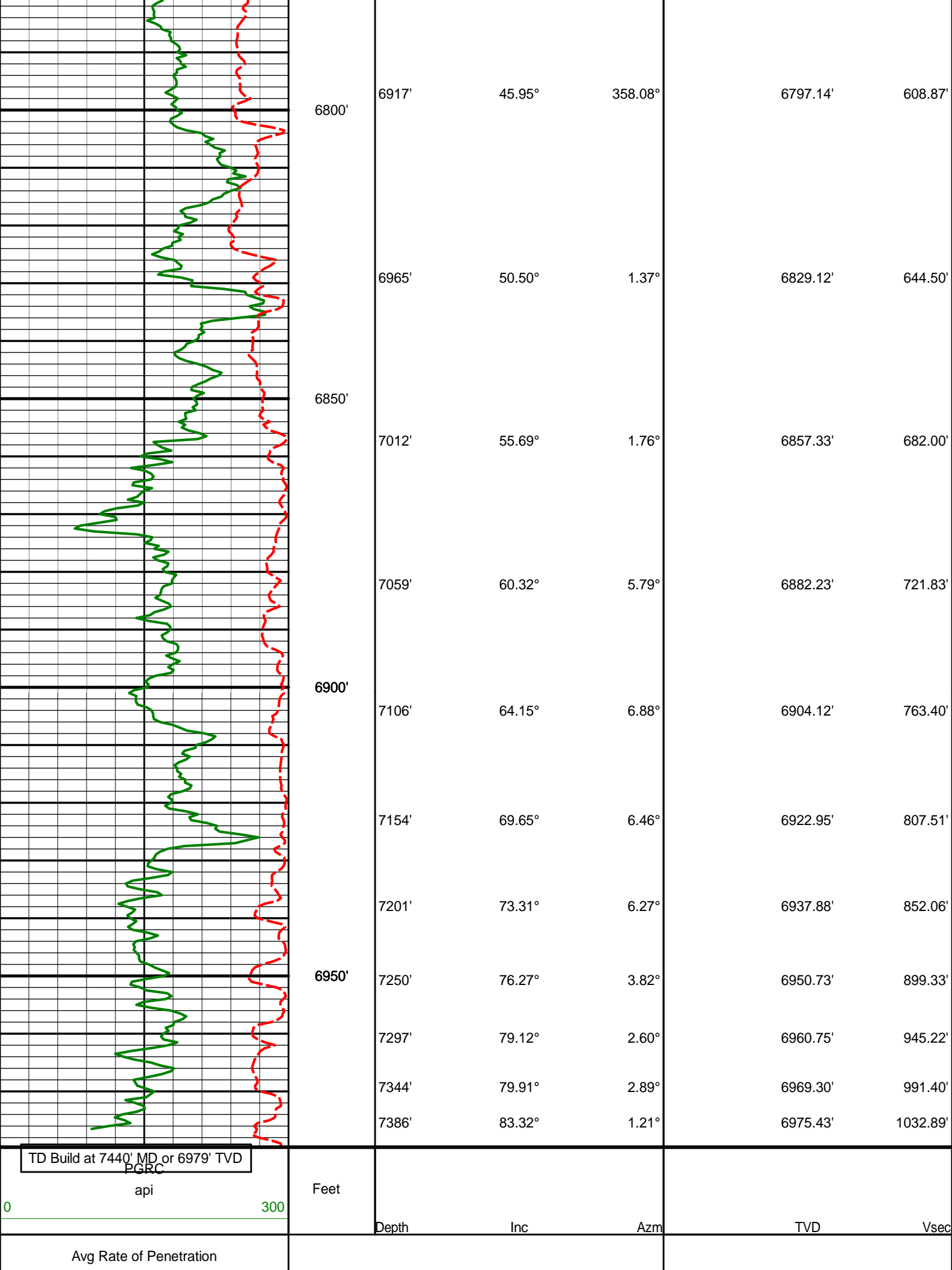


KOP

6203'	0.57°	308.89°	6130.05'	418.63'
6150'				
6200'				
6298'	0.89°	334.05°	6225.04'	419.53'
6250'				
6343'	2.48°	8.58°	6270.02'	420.80'
6300'				
6394'	4.80°	11.59°	6320.92'	424.01'







TD Build at 7440' MD or 6979' TVD
PGRC

api

Feet

Depth

Inc

Azm

TVD

Vsec

Avg Rate of Penetration



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Kern GW17-78HN
Wattenberg
Weld CO
USA
CA-XX-0009518813

<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>
947.00	0.00	0.00	947.00	0.00 N	0.00 E	0.00	TIE-IN
1017.00	0.43	112.48	1017.00	0.10 S	0.24 E	-0.08	0.61
1112.00	0.61	118.34	1112.00	0.47 S	1.01 E	-0.38	0.19
1204.00	0.44	64.81	1203.99	0.55 S	1.76 E	-0.40	0.54
1296.00	0.47	113.59	1295.99	0.55 S	2.43 E	-0.34	0.41
1387.00	0.28	77.98	1386.99	0.66 S	2.99 E	-0.39	0.32
1480.00	0.25	194.02	1479.99	0.80 S	3.17 E	-0.52	0.49
1572.00	0.22	116.54	1571.99	1.08 S	3.27 E	-0.78	0.32
1664.00	0.28	129.08	1663.99	1.30 S	3.61 E	-0.98	0.09
1756.00	0.26	119.62	1755.98	1.54 S	3.97 E	-1.19	0.05
1849.00	0.25	163.05	1848.98	1.84 S	4.21 E	-1.47	0.20
2033.00	0.33	185.06	2032.98	2.75 S	4.28 E	-2.37	0.07
2125.00	0.88	139.21	2124.98	3.56 S	4.72 E	-3.13	0.75
2217.00	3.12	82.50	2216.92	3.76 S	7.66 E	-3.08	2.97
2310.00	5.01	72.66	2309.68	2.23 S	14.04 E	-0.99	2.16
2403.00	7.18	61.02	2402.16	1.80 N	23.00 E	3.81	2.68
2497.00	8.98	56.54	2495.22	8.70 N	34.26 E	11.66	2.02
2593.00	10.87	52.38	2589.78	18.35 N	47.68 E	22.45	2.10
2688.00	12.24	55.64	2682.85	29.50 N	63.09 E	34.91	1.60
2783.00	14.55	51.30	2775.26	42.65 N	80.72 E	49.55	2.65
2878.00	14.13	51.07	2867.30	57.40 N	99.06 E	65.85	0.44
2972.00	16.51	46.16	2957.96	73.87 N	117.62 E	83.87	2.88
3067.00	17.36	43.41	3048.84	93.51 N	137.10 E	105.15	1.23
3162.00	18.06	42.45	3139.34	114.67 N	156.78 E	127.95	0.80
3257.00	16.62	40.84	3230.02	135.82 N	175.60 E	150.66	1.60
3352.00	15.50	49.00	3321.32	154.42 N	194.07 E	170.81	2.65
3446.00	15.90	49.57	3411.82	171.01 N	213.35 E	189.03	0.46
3542.00	16.28	47.63	3504.06	188.61 N	233.29 E	208.30	0.68
3637.00	15.65	54.35	3595.40	205.05 N	253.55 E	226.45	2.05
3731.00	14.39	53.74	3686.19	219.36 N	273.27 E	242.43	1.35
3827.00	13.52	52.79	3779.35	233.20 N	291.83 E	257.84	0.94
3922.00	14.10	54.67	3871.61	246.61 N	310.11 E	272.80	0.77
4017.00	15.41	54.98	3963.47	260.54 N	329.89 E	288.41	1.39
4112.00	15.93	54.94	4054.94	275.28 N	350.90 E	304.93	0.55
4207.00	17.25	55.50	4145.98	290.75 N	373.19 E	322.29	1.40
4303.00	15.66	51.20	4238.05	306.93 N	395.02 E	340.32	2.09
4398.00	13.09	47.15	4330.07	322.28 N	412.90 E	357.18	2.90
4493.00	11.36	43.69	4422.91	336.37 N	427.25 E	372.46	1.98
4587.00	8.73	36.96	4515.47	348.77 N	437.94 E	385.75	3.06
4683.00	6.21	25.43	4610.65	359.28 N	444.56 E	396.80	3.05
4777.00	3.80	8.99	4704.29	366.94 N	447.22 E	404.67	2.95
4872.00	2.31	4.83	4799.15	371.96 N	447.88 E	409.73	1.58
4967.00	0.23	16.02	4894.12	374.06 N	448.09 E	411.83	2.19
5063.00	0.22	115.77	4990.12	374.17 N	448.31 E	411.96	0.36
5158.00	0.30	123.72	5085.12	373.95 N	448.68 E	411.77	0.10
5253.00	0.33	182.58	5180.12	373.54 N	448.88 E	411.38	0.33
5348.00	0.28	103.41	5275.12	373.21 N	449.09 E	411.08	0.41
5443.00	0.53	53.14	5370.12	373.42 N	449.66 E	411.34	0.43
5538.00	0.59	65.14	5465.11	373.89 N	450.45 E	411.87	0.14
5633.00	0.61	19.64	5560.11	374.57 N	451.07 E	412.60	0.49
5728.00	0.94	0.37	5655.10	375.82 N	451.24 E	413.86	0.44
5823.00	0.77	346.66	5750.09	377.22 N	451.10 E	415.24	0.28
5918.00	0.83	311.69	5845.08	378.30 N	450.44 E	416.26	0.51

6013.00	0.74	301.63	5940.07	379.07 N	449.40 E	416.94	0.17
6108.00	1.01	318.41	6035.06	380.02 N	448.33 E	417.79	0.38
6203.00	0.57	308.89	6130.05	380.94 N	447.41 E	418.63	0.48
6298.00	0.89	334.05	6225.04	381.90 N	446.71 E	419.53	0.47
6343.00	2.48	8.58	6270.02	383.18 N	446.71 E	420.80	4.03
6394.00	4.80	11.59	6320.92	386.36 N	447.30 E	424.01	4.57
6441.00	6.96	9.06	6367.67	391.10 N	448.14 E	428.81	4.63
6489.00	8.62	4.46	6415.22	397.55 N	448.88 E	435.31	3.68
6536.00	10.49	5.44	6461.57	405.32 N	449.56 E	443.11	4.00
6584.00	12.64	8.93	6508.59	414.86 N	450.79 E	452.72	4.71
6631.00	16.91	6.44	6554.03	426.74 N	452.35 E	464.69	9.18
6679.00	21.88	5.15	6599.29	442.60 N	453.94 E	480.62	10.39
6726.00	25.87	3.26	6642.26	461.56 N	455.31 E	499.63	8.64
6775.00	30.97	359.51	6685.35	484.86 N	455.81 E	522.88	11.03
6822.00	34.64	355.85	6724.85	510.28 N	454.74 E	548.12	8.87
6870.00	40.45	356.41	6762.89	539.46 N	452.77 E	577.01	12.12
6917.00	45.95	358.08	6797.14	571.58 N	451.25 E	608.87	11.94
6965.00	50.50	1.37	6829.12	607.35 N	451.12 E	644.50	10.77
7012.00	55.69	1.76	6857.33	644.91 N	452.15 E	682.00	11.07
7059.00	60.32	5.79	6882.23	684.66 N	454.80 E	721.83	12.24
7106.00	64.15	6.88	6904.12	725.98 N	459.40 E	763.40	8.39
7154.00	69.65	6.46	6922.95	769.82 N	464.52 E	807.51	11.49
7201.00	73.31	6.27	6937.88	814.10 N	469.46 E	852.06	7.81
7250.00	76.27	3.82	6950.73	861.19 N	473.61 E	899.33	7.72
7297.00	79.12	2.60	6960.75	907.04 N	476.18 E	945.22	6.59
7344.00	79.91	2.89	6969.30	953.20 N	478.39 E	991.40	1.78
7386.00	83.32	1.21	6975.43	994.71 N	479.88 E	1032.89	9.03

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 5.02 DEGREES (GRID)
A TOTAL CORRECTION OF 7.90 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7386.00 FEET
IS 1104.42 FEET ALONG 25.75 DEGREES (GRID)**