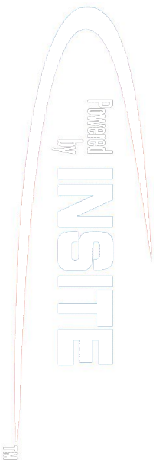


PCG Pressure Case Gamma

PCD Pressure Case Directional



Country : USA			
Field : Wattenberg			
Location : Lat: 40° 14' 52.48" North Long: 104° 33' 10.76" West			
Well : Marie D04-73-1HN			
Company : Noble Energy			
Rig : H&P 343		<div>Company : Noble Energy</div> <div>Rig : H&amp;P 343</div> <div>Well : Marie D04-73-1HN</div> <div>Field : Wattenberg</div> <div>Country : USA</div> <div>API Number : 05-123-38312</div>	
LOCATION			
Latitude : 40° 14' 52.48" North Longitude : 104° 33' 10.76" West			
UTM Easting = 3,264,338.770 ft UTM Northing = 1,334,566.850 ft		Other Services Directional Drilling	
Permanent Datum : Ground Level		Elev. KB NA	
Log Measured From : Drill Floor		24.00 ft Above Permanent Datum DF 4744.00 ft GL 4720.00 ft WD NA	
Drilling Measured From : Drill Floor		TVD LOG	
Depth Logged : 697.99 ft To 6,704.47 ft		Unit No. : 11610115	
Date Logged : 17-Jan-14 To 23-Jan-14		Job No. : CA-XX-0900918615	
Total Depth MD : 11,120.00 ft TVD : 6,704.47 ft		Plot Type : Final	
Spud Date : 17-Jan-14		Plot Date : 23-Jan-14	
Run No.	Borehole Record (TVD)		Run No.
	Size From To	Size From To	
2	8.750 in	697.99 ft	Size From To
	8.750 in	6,001.27 ft	
3	8.750 in	6,001.27 ft	Size From To
	8.750 in	6,712.89 ft	
	Casing Record (TVD)		Size From To
	Size Weight	From To	
	9.625 in	36.00 lbpf	SURFACE
	7.000 in	26.00 lbpf	
	SURFACE		SURFACE

Max Tool Temp (degF) / Source	158.60 / PCM	170.37 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	NA @ NA			
Lead MWD Engineer	Gary Eifert	Gary Eifert			
Customer Representative	Johnny Sanchez	Johnny Sanchez			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11341330	11341330			
Insert Serial Number	10997273	10997273			
Date and Time Initialized	18-Jan-14 13:31	01-Jan-70 00:00			
Date and Time Read	20-Jan-14 22:26	20-Jan-14 22:21			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	56.00	53.00			
Software Version	6.21	6.21			
Sub Serial Number	11341330	11341330			
Sonde Serial Number	11477956	11477956			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	289.81	266.13			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.62	45.93			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	1341330	1341330			
Insert/Sonde Serial Number	12037425	12037425			

## REMARKS

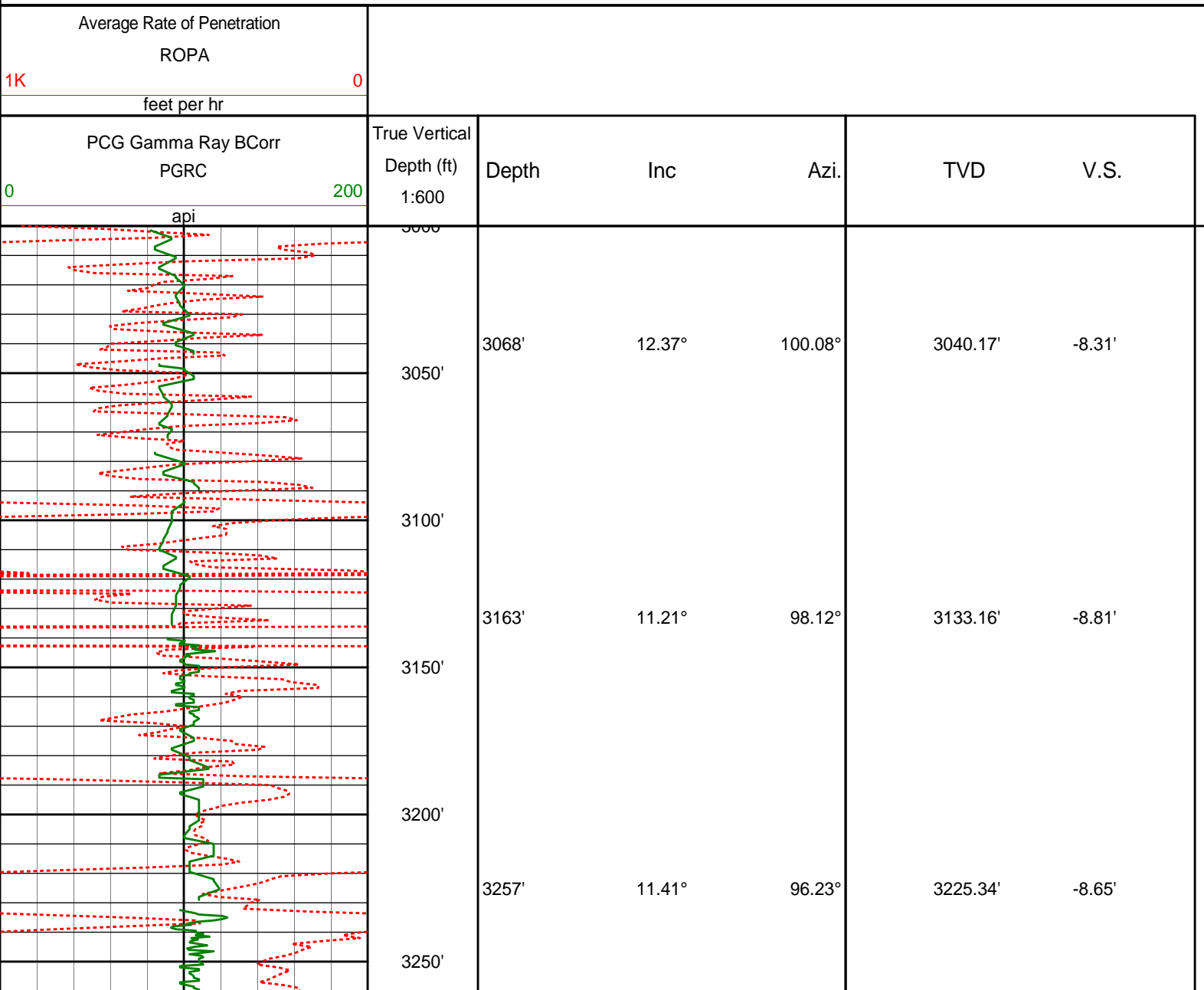
1. All depths are true vertical depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annual velocities are calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:  
PGRC (Corrected Gamma Ray):  
Interval Resolution: 0.5 ft  
Interval Distance: 0.6 ft  
Gap Fill: 3.0 ft  
ROPA (Average Rate of Penetration)  
Interval Resolution: 0.5 ft  
Interval Distance: 1.2 ft  
Gap Fill: 3.0 ft
6. INSITE version 8.0

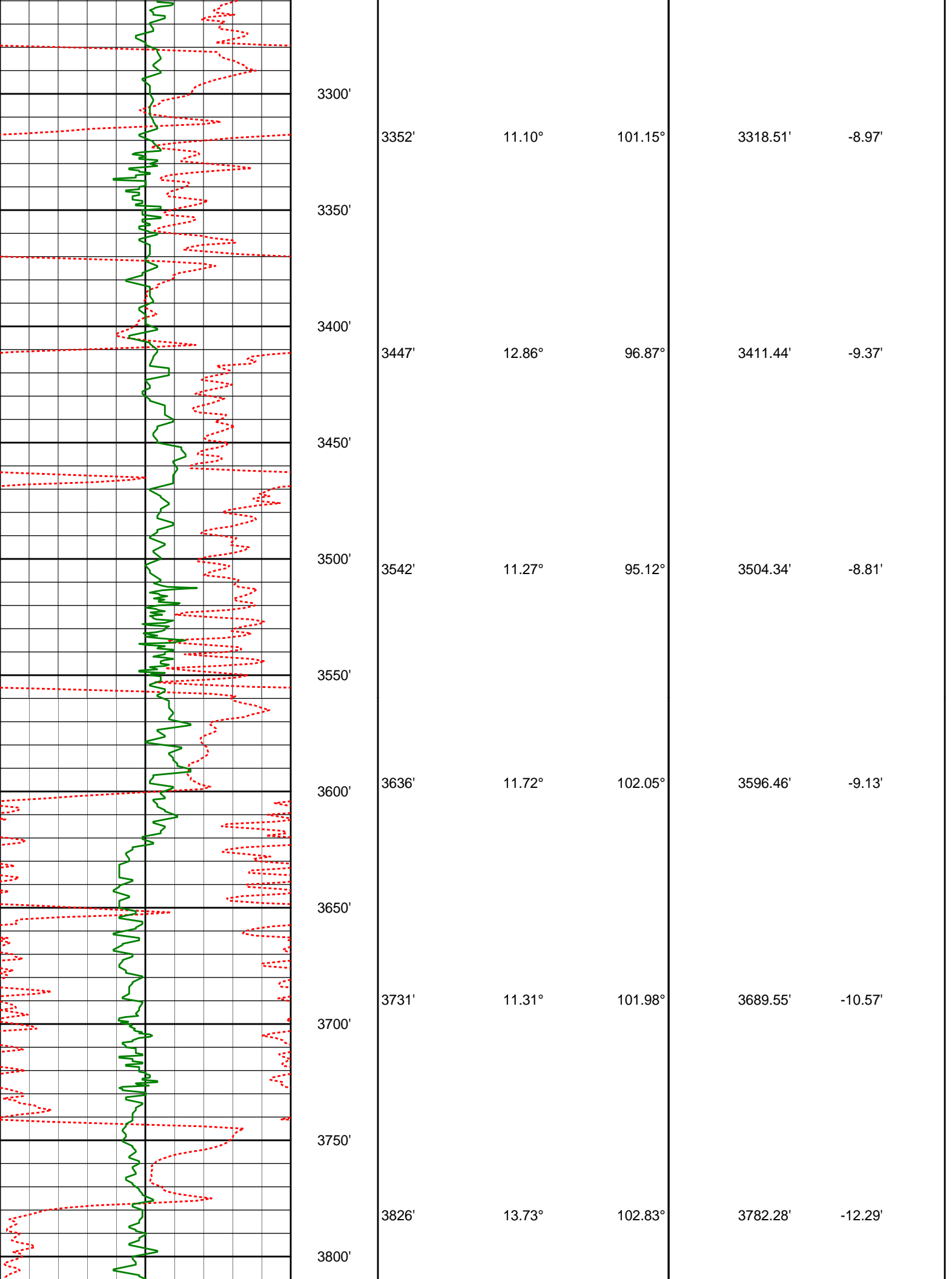
# WARRANTY

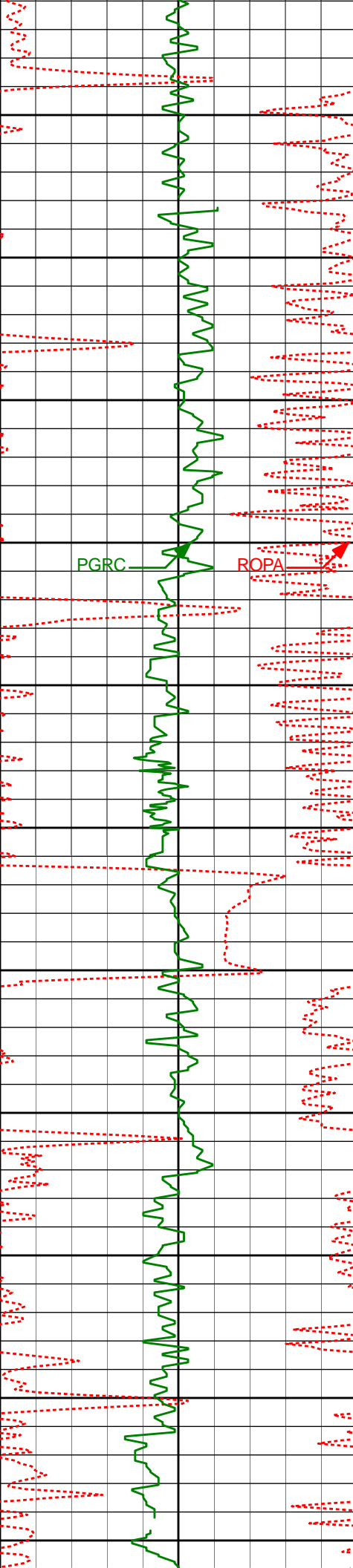
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES 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

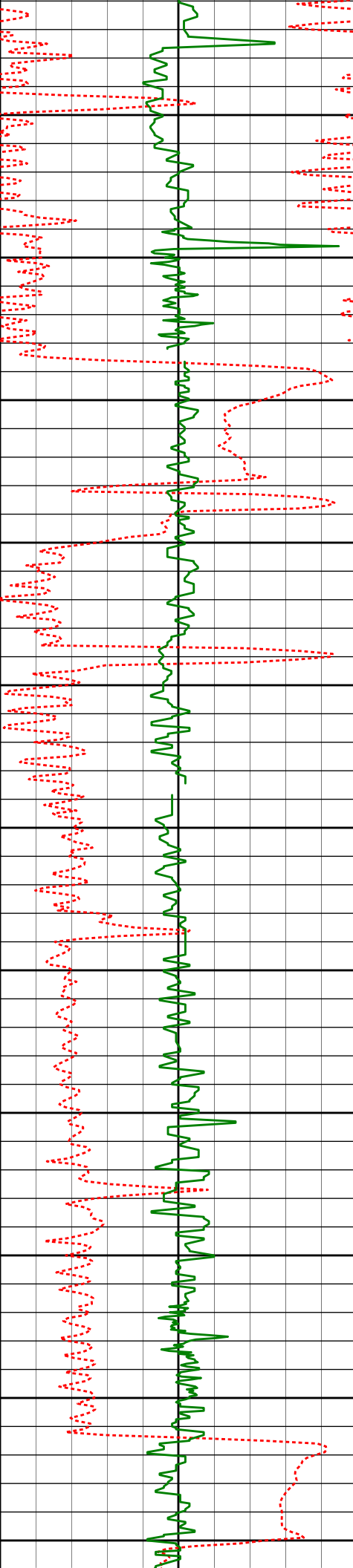
### TVD Main Log 1:600







3850'				
3921'	13.30°	104.18°	3874.65'	-14.54'
3900'				
3950'				
4016'	11.79°	101.56°	3967.39'	-16.44'
4000'				
4050'				
4111'	10.50°	101.58°	4060.59'	-17.69'
4100'				
4150'				
4205'	13.06°	98.69°	4152.61'	-18.46'
4200'				
4250'				
4301'	11.88°	95.77°	4246.34'	-18.33'
4300'				
4396'	11.09°	96.12°	4339.44'	-17.76'
4350'				



4400'

4490'

10.75°

95.33°

4431.73'

-17.15'

4450'

4585'

7.75°

90.11°

4525.49'

-15.95'

4550'

4600'

4680'

6.06°

85.05°

4619.80'

-14.01'

4650'

4700'

4774'

5.17°

77.21°

4713.35'

-11.45'

4750'

4800'

4869'

5.02°

72.99°

4807.97'

-8.21'

4850'

4900'

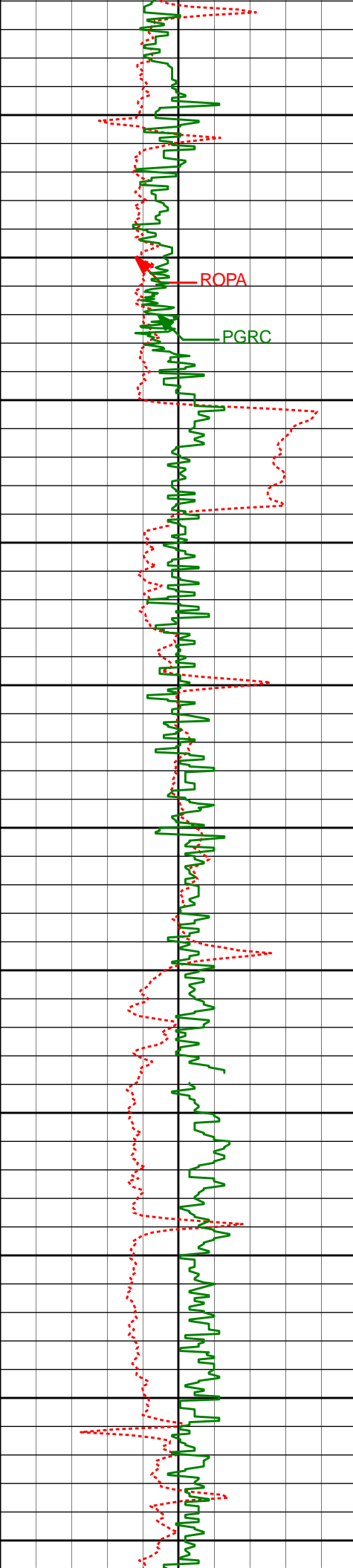
4964'

3.88°

106.45°

4902.70'

-6.97'



4950'

5000'

5050'

5100'

5150'

5200'

5250'

5300'

5350'

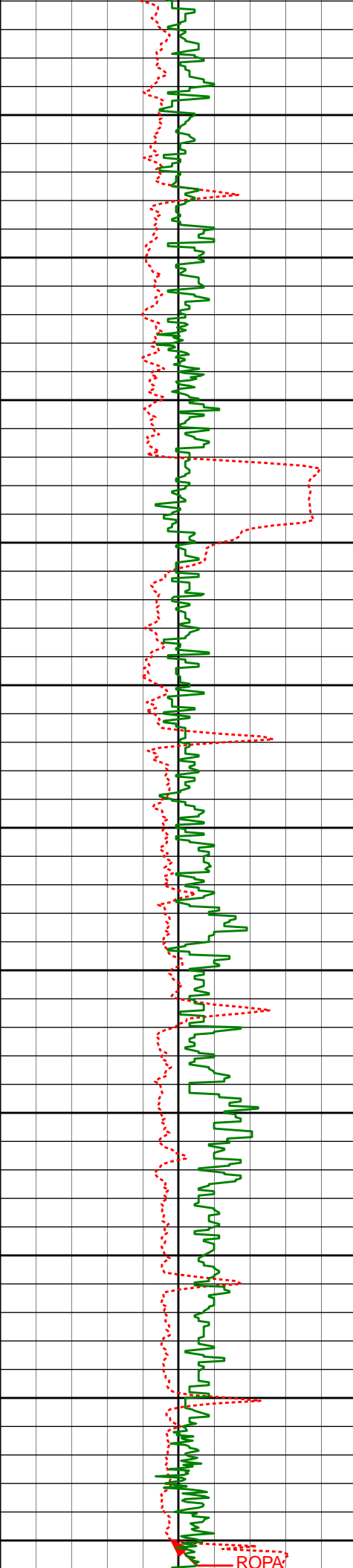
5400'

5450'

ROPA

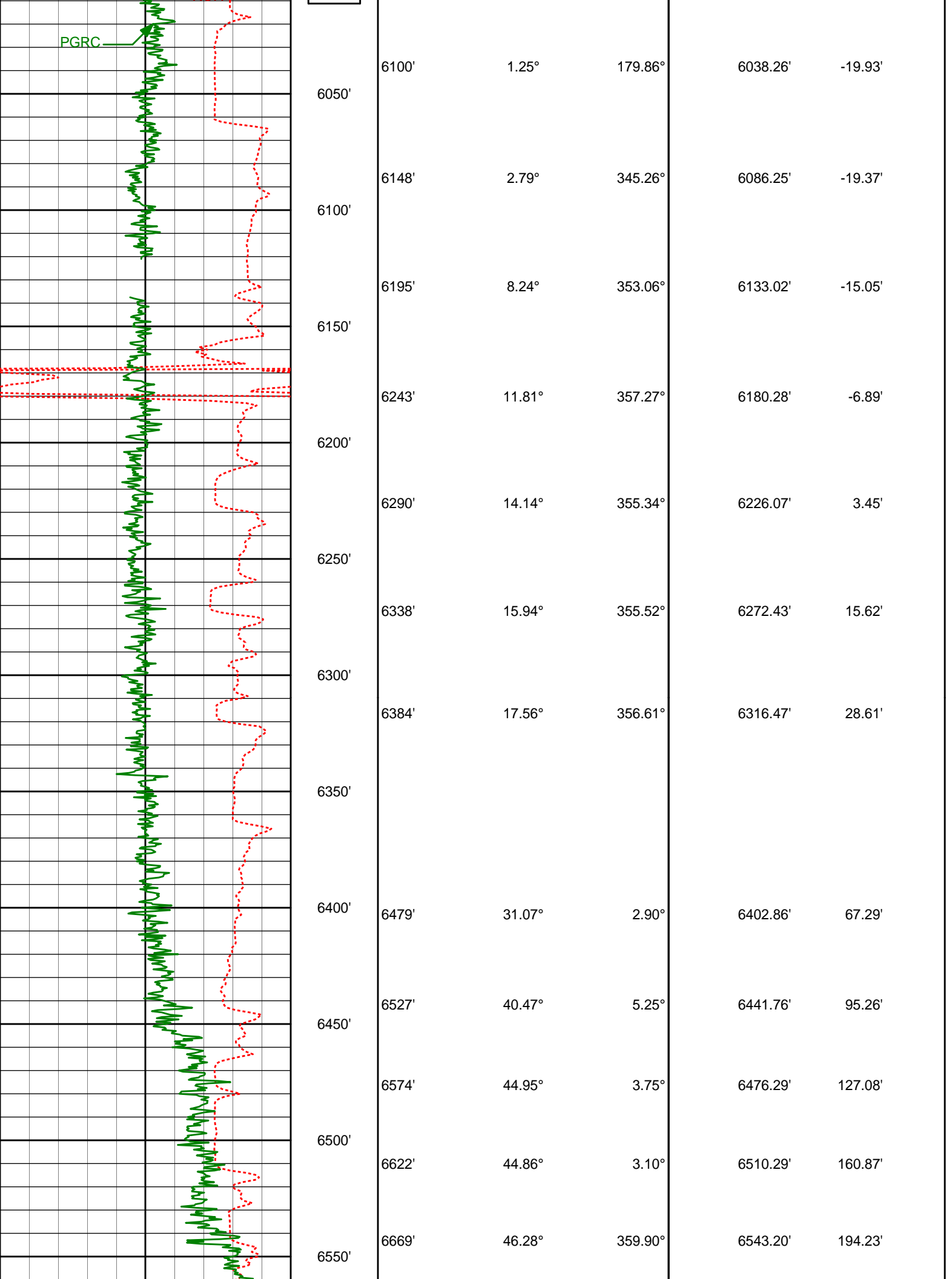
PGRC

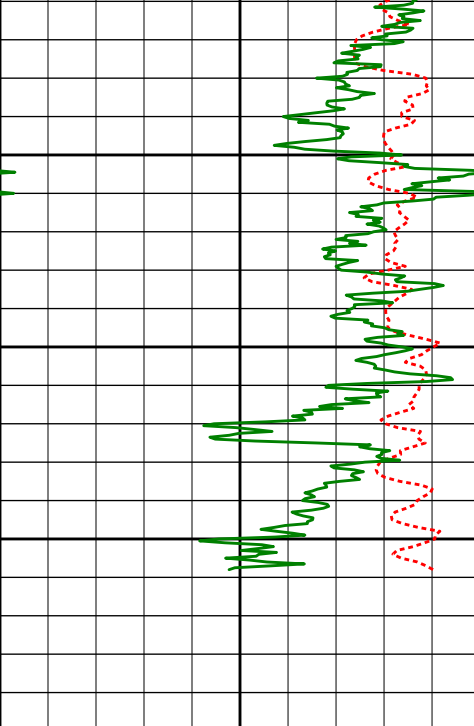
5059'	3.41°	114.74°	4997.51'	-8.29'
5154'	0.98°	151.40°	5092.44'	-9.77'
5249'	1.07°	124.69°	5187.42'	-10.83'
5344'	0.59°	98.51°	5282.41'	-11.24'
5438'	1.03°	112.87°	5376.40'	-11.47'



5533'	1.21°	88.50°	5471.38'	-11.53'
5500'				
5550'				
5628'	0.91°	81.98°	5566.37'	-11.17'
5600'				
5650'				
5723'	1.70°	180.99°	5661.35'	-12.37'
5700'				
5750'				
5817'	1.16°	164.92°	5755.32'	-14.63'
5800'				
5850'				
5912'	0.83°	153.14°	5850.31'	-16.08'
5900'				
5950'				
6007'	1.44°	172.95°	5945.29'	-17.80'
6000'				
Run 200				

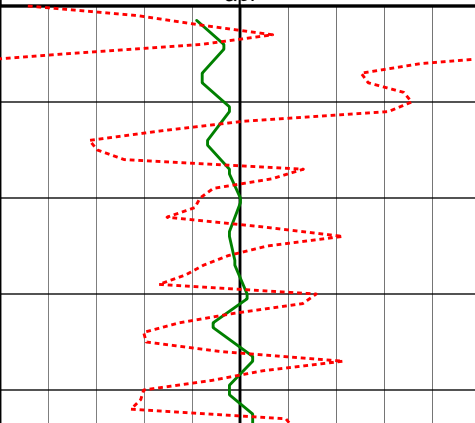


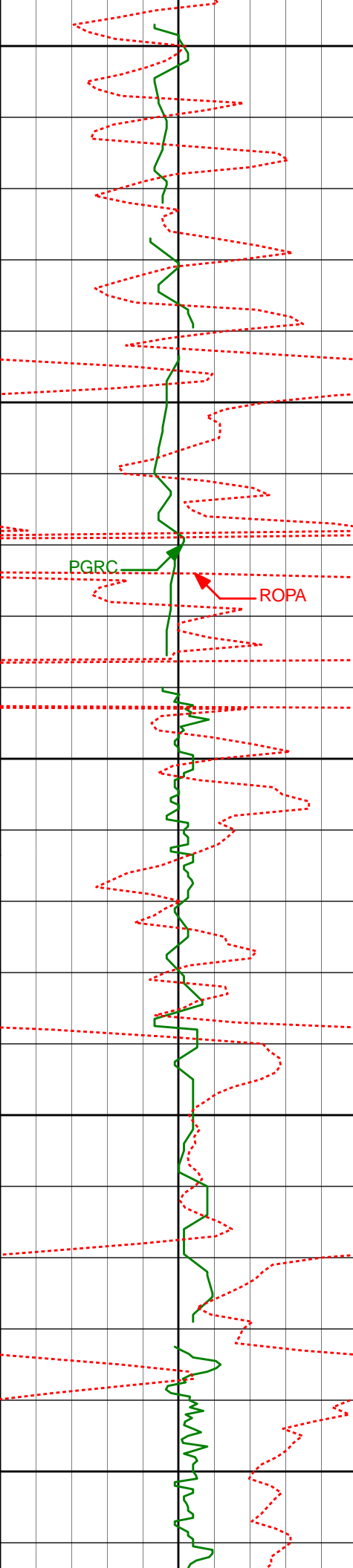


		6600'	6717'	48.93°	355.07°	6575.57'	229.09'
			6763'	53.30°	353.67°	6604.44'	263.92'
			6811'	59.41°	354.90°	6631.02'	302.78'
		6650'	6858'	66.14°	355.77°	6652.51'	343.59'
			6906'	70.67°	357.14°	6670.18'	387.35'
			6953'	73.83°	359.28°	6684.50'	431.50'
		6700'	7001'	77.02°	359.54°	6696.58'	477.47'
			7065'	83.10°	359.90°	6707.63'	539.87'
		Casing Shoe @ 6711'					
6750'							
PCG Gamma Ray BCorr PGRC 0 200 api		True Vertical Depth (ft) 1:600	Depth Inc Azi.		TVD V.S.		
Average Rate of Penetration ROPA 1K 0 feet per hr							

HALLIBURTON

TVD Main Log 1:240

Average Rate of Penetration ROPA 1K 0 feet per hr						
PCG Gamma Ray BCorr PGRC 0 200 api		Measured Depth (ft) 1:240	Depth Inc Azi.		TVD V.S.	
		3068'	12.37°	100.08°	3040.17'	-8.31'



3050'

3100'

3150'

3200'

3250'

PGRC

ROPA

3163'

11.21°

98.12°

3133.16'

-8.81'

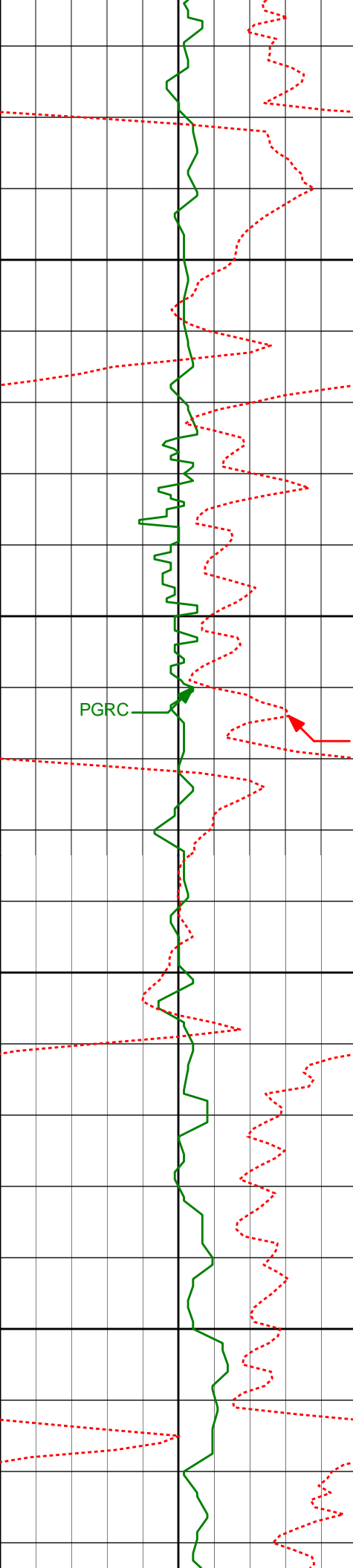
3257'

11.41°

96.23°

3225.34'

-8.65'



3300'

3350'

3400'

3450'

PGRC

ROPA

3352'

11.10°

101.15°

3318.51'

-8.97'

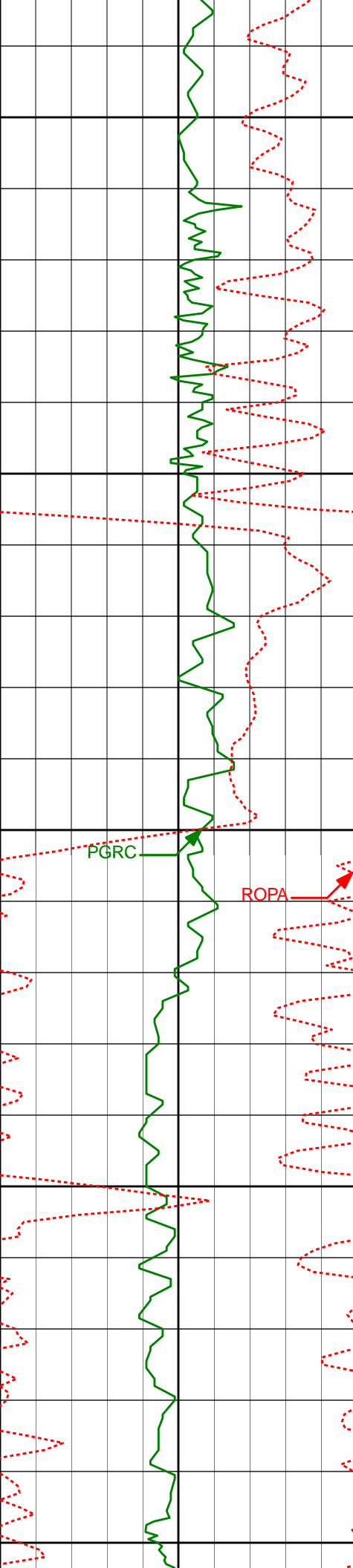
3447'

12.86°

96.87°

3411.44'

-9.37'



3500'

3542'

11.27°

95.12°

3504.34'

-8.81'

3550'

3600'

3636'

11.72°

102.05°

3596.46'

-9.13'

3650'

3700'

3731'

11.31°

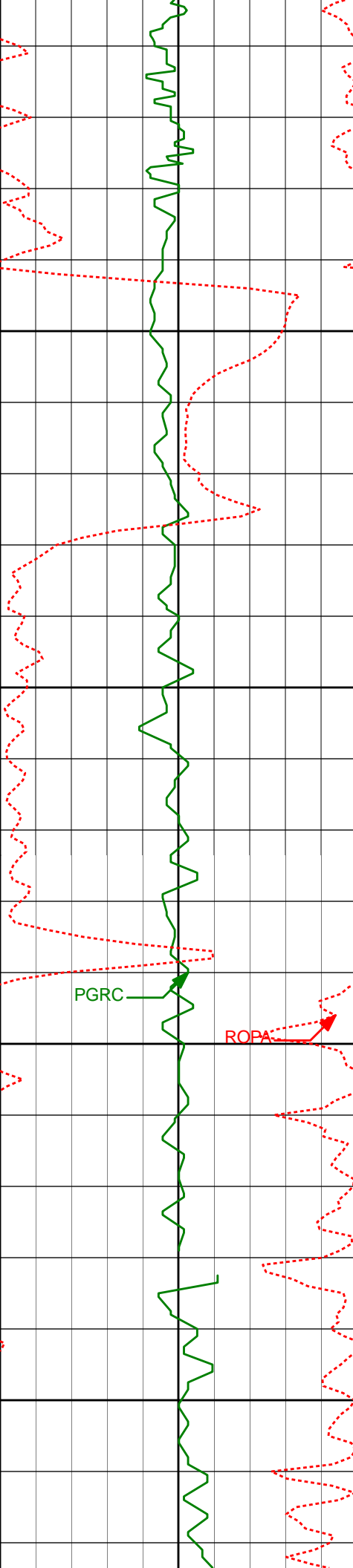
101.98°

3689.55'

-10.57'

PGRC

ROPA



3750'

3800'

3850'

3900'

PGRC

ROPA

3826'

13.73°

102.83°

3782.28'

-12.29'

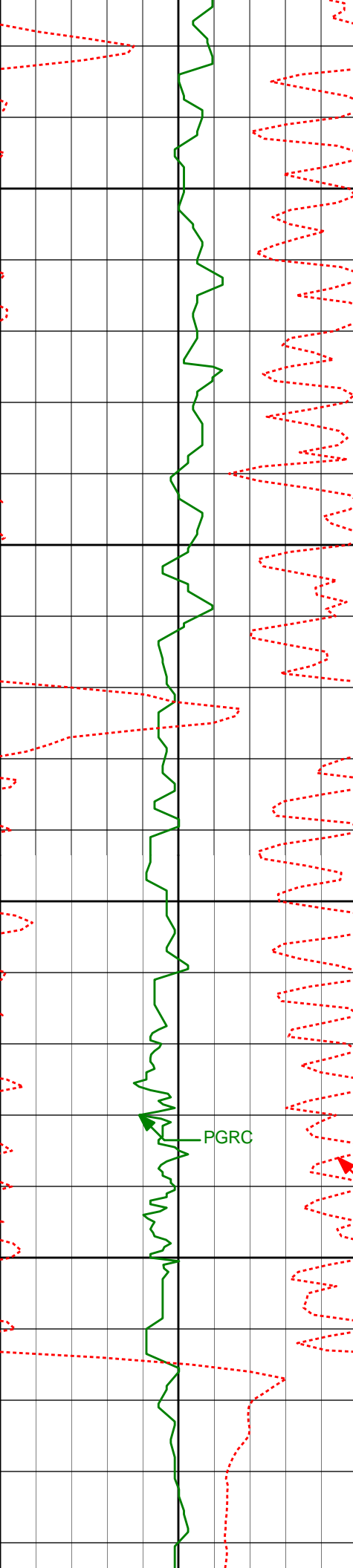
3921'

13.30°

104.18°

3874.65'

-14.54'



3950'

4016'

11.79°

101.56°

3967.39'

-16.44'

4000'

4050'

4111'

10.50°

101.58°

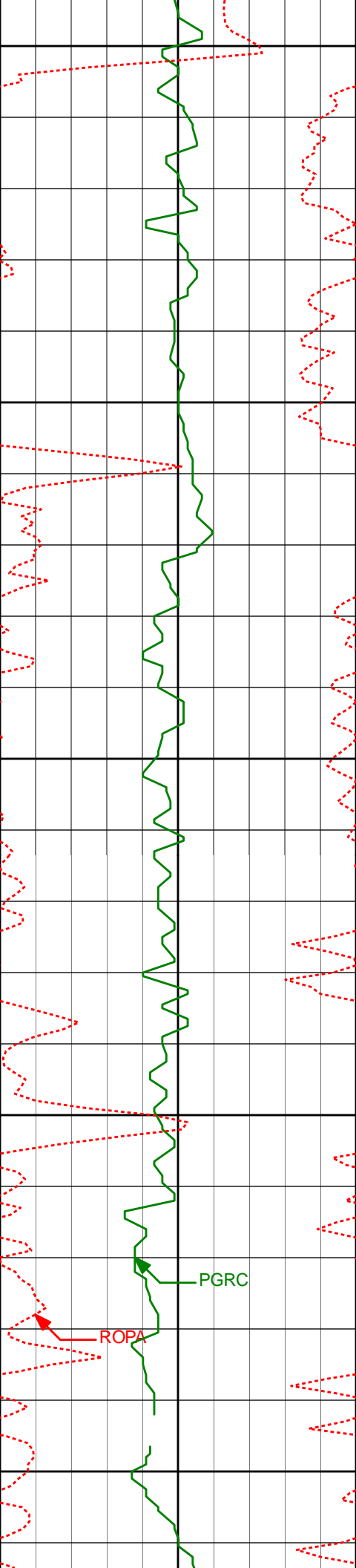
4060.59'

-17.69'

4100'

PGRC

ROPA



4150'

4205'

13.06°

98.69°

4152.61'

-18.46'

4200'

4250'

4301'

11.88°

95.77°

4246.34'

-18.33'

4300'

PGRC

ROPA

4396'

11.09°

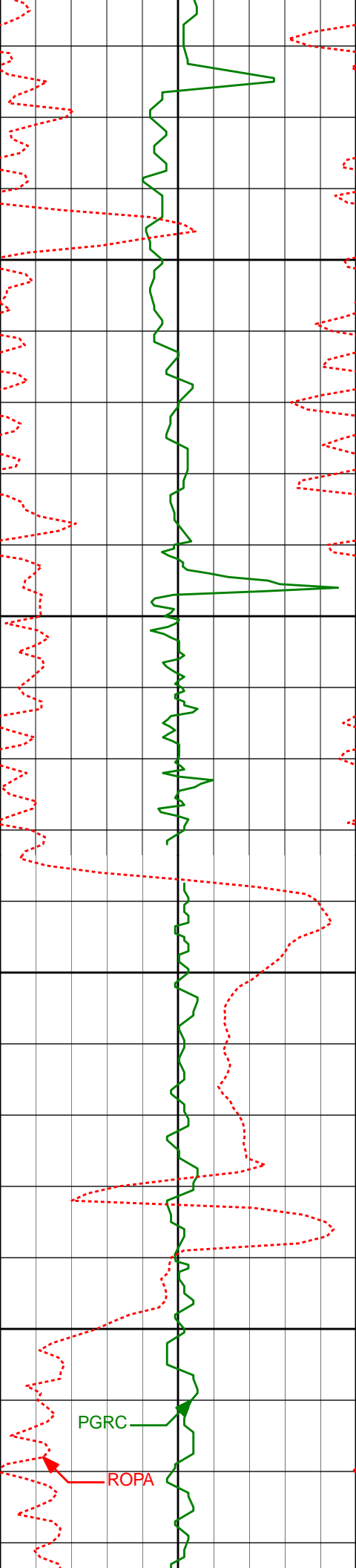
96.12°

4339.44'

-17.76'

4350'





4400'

4490'

10.75°

95.33°

4431.73'

-17.15'

4450'

4500'

4585'

7.75°

90.11°

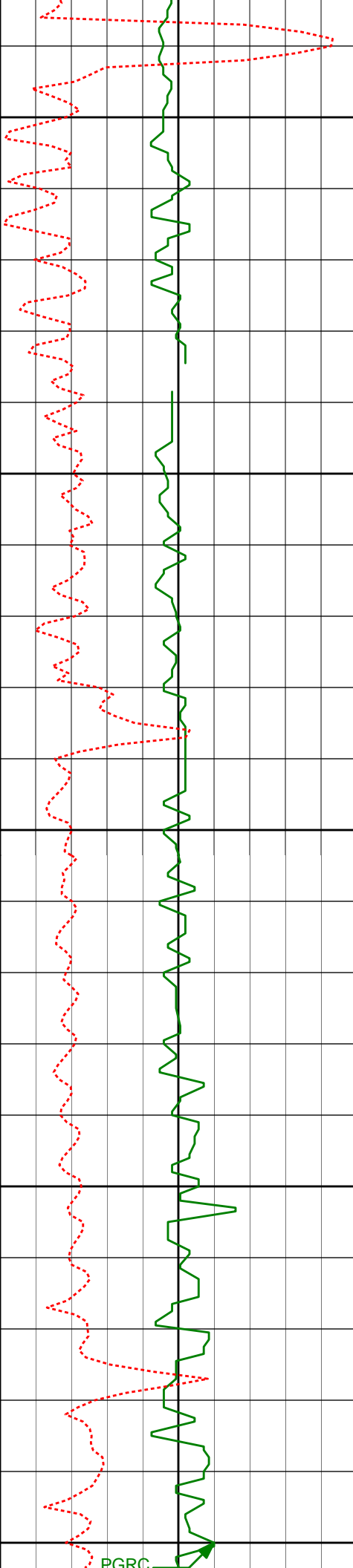
4525.49'

-15.95'

4550'

PGRC

ROPA



4600'

4680'

6.06°

85.05°

4619.80'

-14.01'

4650'

4700'

4774'

5.17°

77.21°

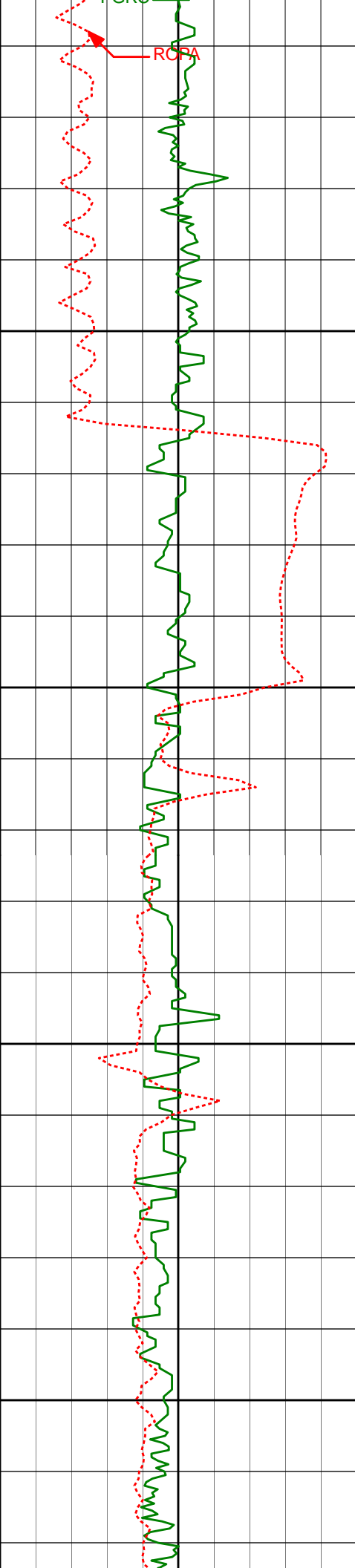
4713.35'

-11.45'

4750'

4800'

PGRC



4850'

4900'

4950'

5000'

4869'

5.02°

72.99°

4807.97'

-8.21'

4964'

3.88°

106.45°

4902.70'

-6.97'

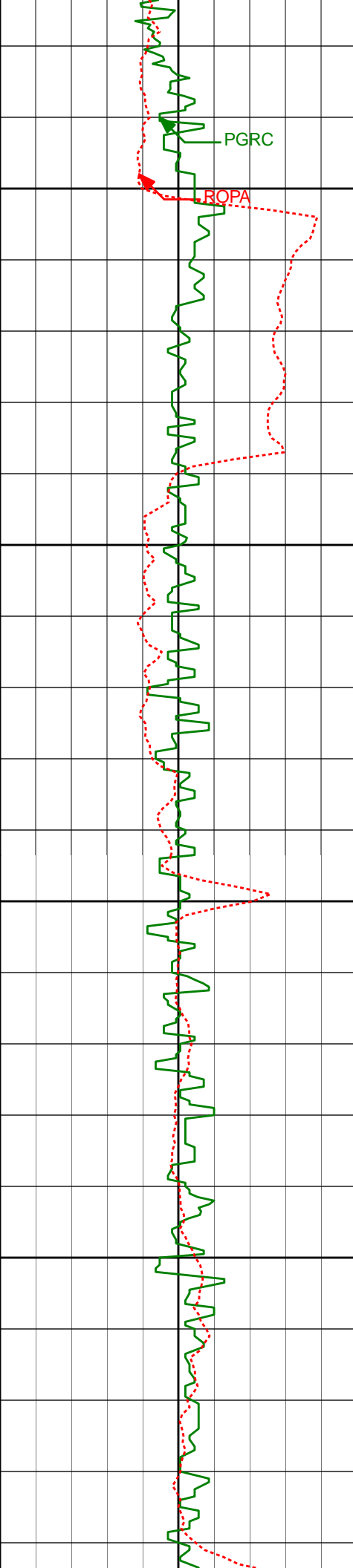
5059'

3.41°

114.74°

4997.51'

-8.29'



5050'

5100'

5150'

5200'

5154'

0.98°

151.40°

5092.44'

-9.77'

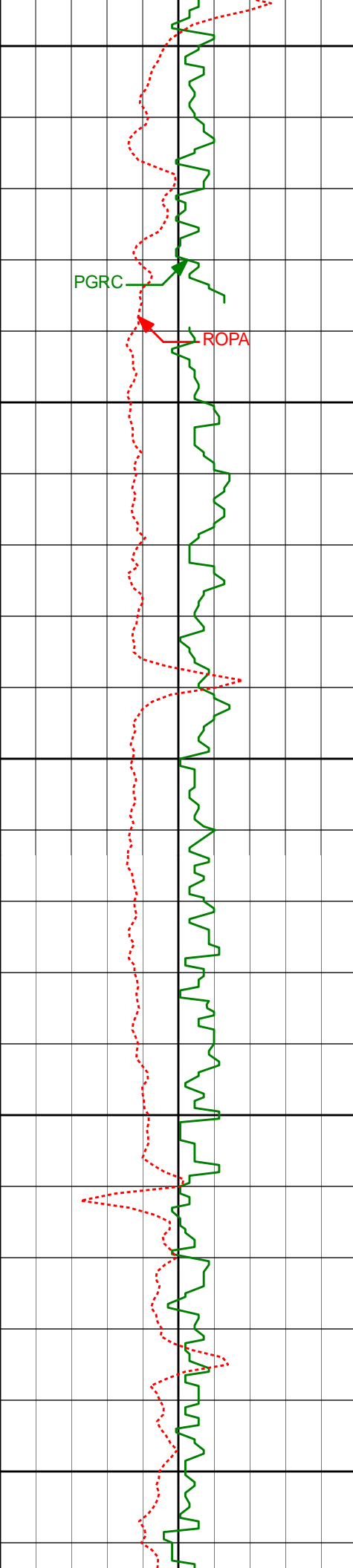
5249'

1.07°

124.69°

5187.42'

-10.83'



5250'

PGRC

ROPA

5344'

0.59°

98.51°

5282.41'

-11.24'

5300'

5350'

5400'

5450'

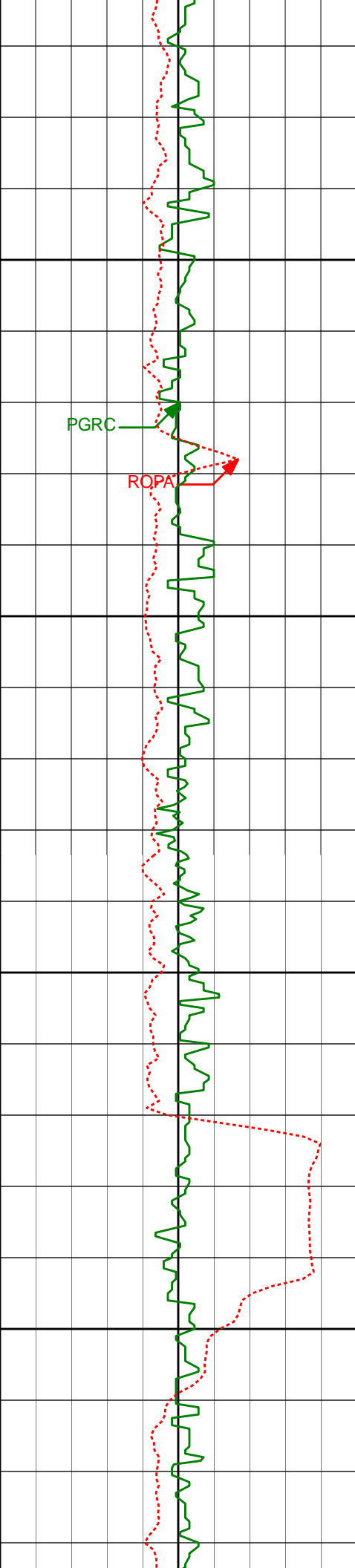
5438'

1.03°

112.87°

5376.40'

-11.47'



5500'

5550'

5600'

5650'

5533'

1.21°

88.50°

5471.38'

-11.53'

5628'

0.91°

81.98°

5566.37'

-11.17'

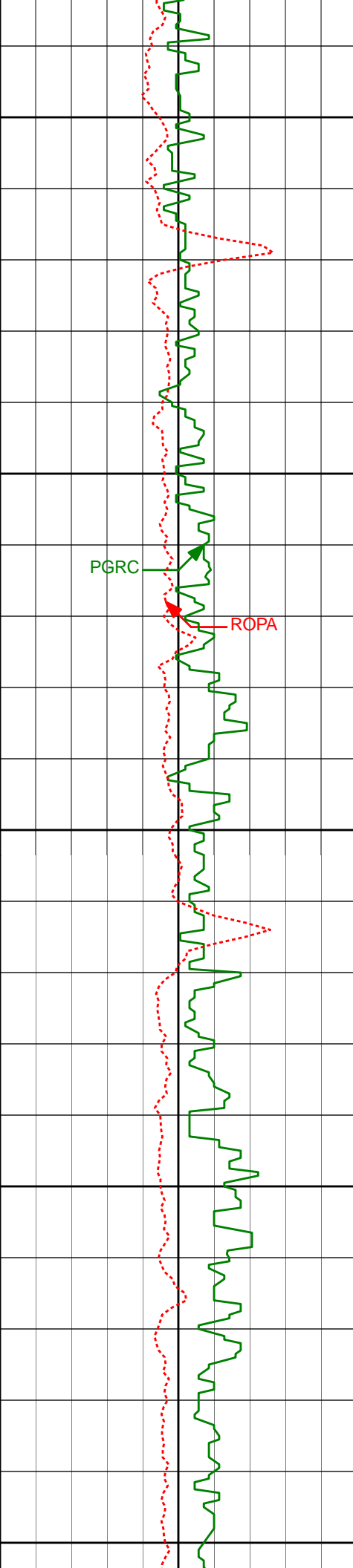
5723'

1.70°

180.99°

5661.35'

-12.37'



5700'

5750'

5800'

5850'

5900'

PGRC

ROPA

5817'

1.16°

164.92°

5755.32'

-14.63'

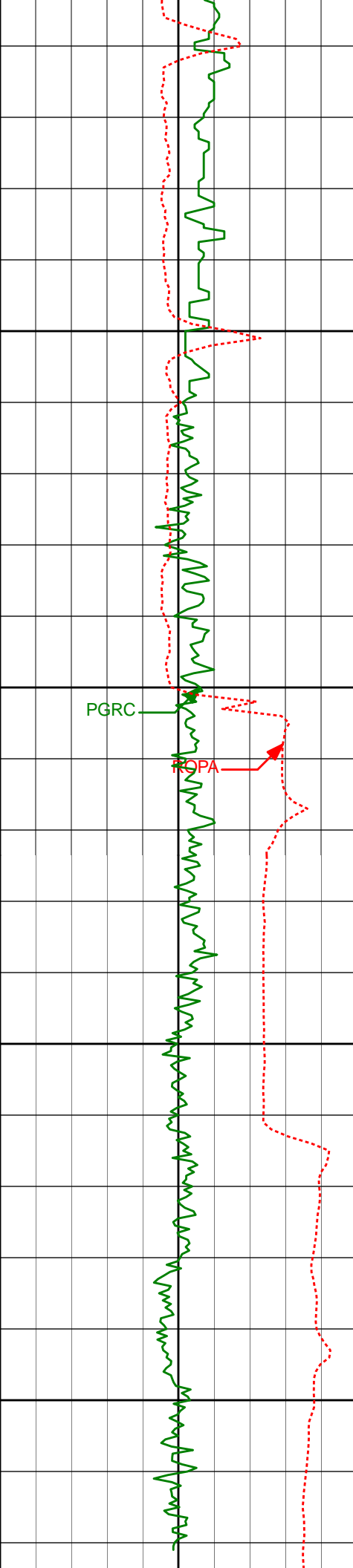
5912'

0.83°

153.14°

5850.31'

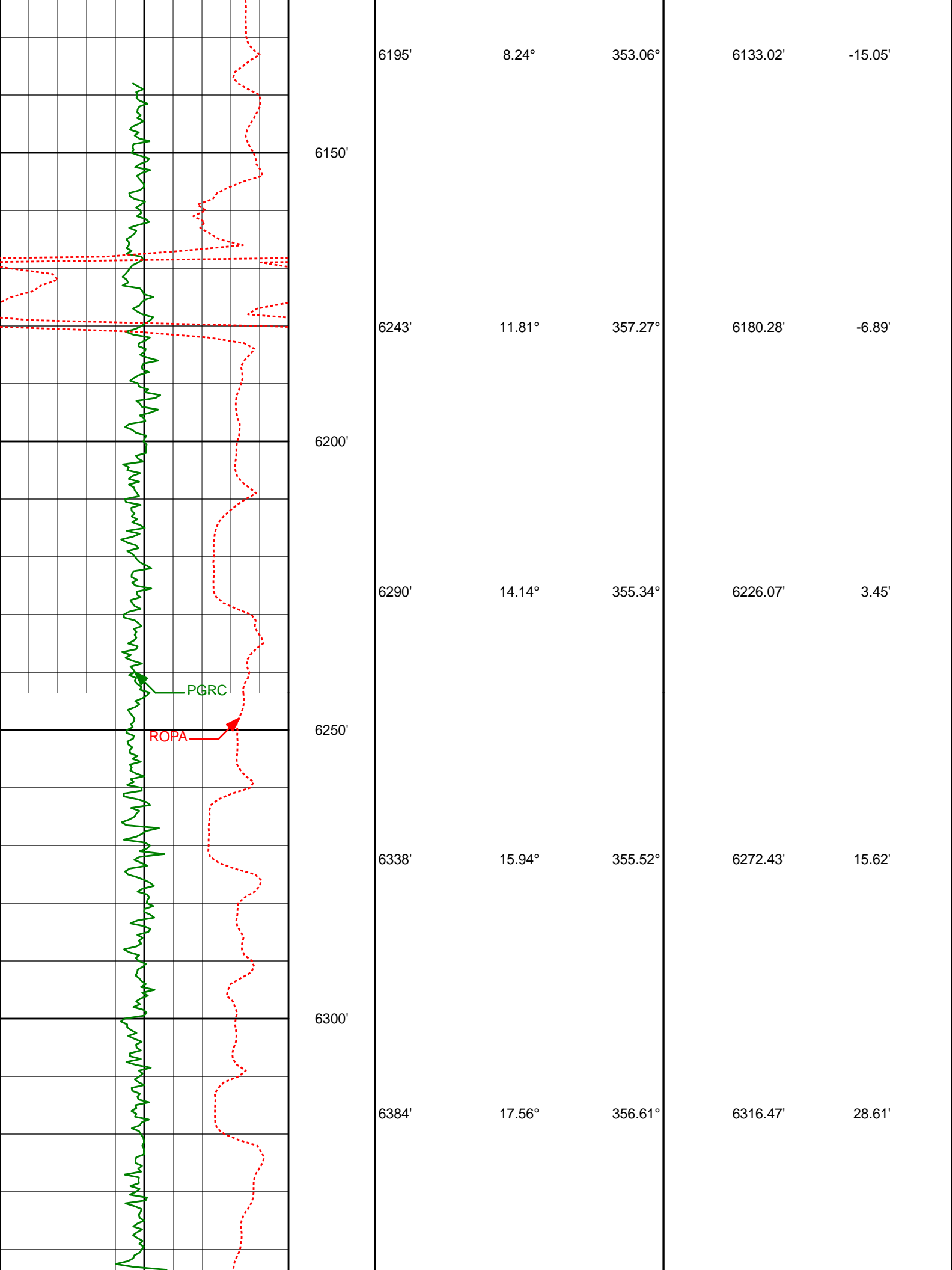
-16.08'

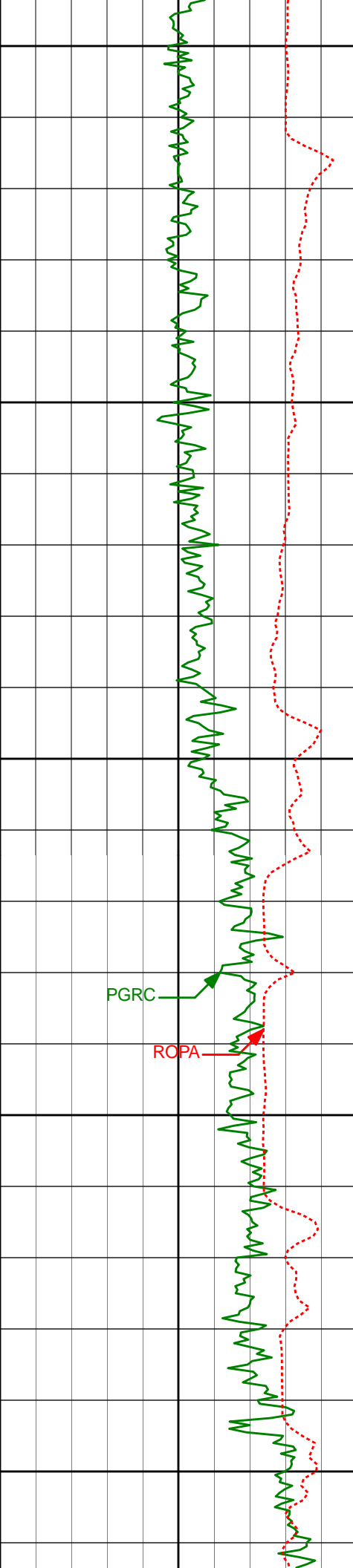


Run 200

6007'	1.44°	172.95°	5945.29'	-17.80'
5950'				
6000'				
6100'	1.25°	179.86°	6038.26'	-19.93'
6050'				
6148'	2.79°	345.26°	6086.25'	-19.37'
6100'				







6350'

6400'

6450'

6500'

6550'

6479'

31.07°

2.90°

6402.86'

67.29'

6527'

40.47°

5.25°

6441.76'

95.26'

6574'

44.95°

3.75°

6476.29'

127.08'

6622'

44.86°

3.10°

6510.29'

160.87'

6669'

46.28°

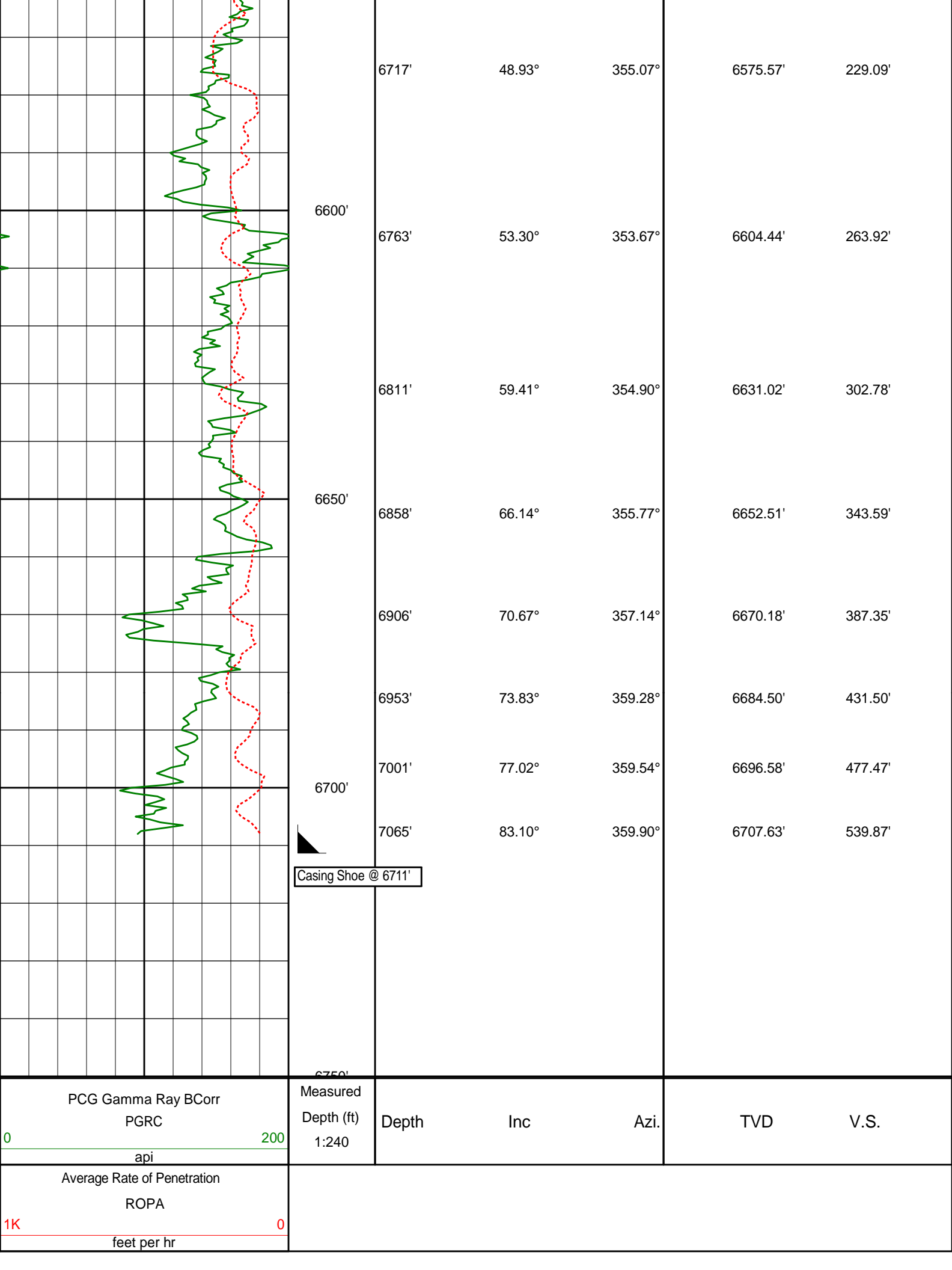
359.90°

6543.20'

194.23'

PGRC

ROPA



# HALLIBURTON

## DIRECTIONAL SURVEY REPORT

Noble Energy  
Marie D04-73-1HN  
Wattenberg  
Weld Colorado  
USA

CA-XX-0900918615

Tie into existing surveys at 325' and 664' provided by HP.

<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
325.00	0.60	354.61	324.99	1.69 N	0.16 W	1.66	0.18
664.00	0.60	152.01	663.99	1.89 N	0.51 E	1.94	0.35
808.00	0.32	296.29	807.99	1.41 N	0.50 E	1.46	0.61
993.00	0.52	51.16	992.98	2.17 N	0.69 E	2.24	0.39
1085.00	0.65	70.48	1084.98	2.60 N	1.51 E	2.78	0.25
1178.00	0.58	80.45	1177.97	2.86 N	2.47 E	3.16	0.14
1271.00	0.80	86.88	1270.97	2.97 N	3.58 E	3.42	0.25
1360.00	0.39	96.97	1359.96	2.97 N	4.51 E	3.54	0.47
1457.00	0.52	84.29	1456.96	2.97 N	5.28 E	3.65	0.17
1551.00	2.66	123.92	1550.92	1.80 N	7.52 E	2.79	2.42
1646.00	5.14	116.79	1645.69	1.35 S	13.15 E	0.42	2.66
1740.00	7.47	115.36	1739.12	5.87 S	22.43 E	-2.82	2.48
1835.00	8.52	111.94	1833.19	11.14 S	34.53 E	-6.43	1.21
1930.00	10.84	107.68	1926.83	16.48 S	49.57 E	-9.72	2.56
2024.00	10.26	98.28	2019.25	20.37 S	66.28 E	-11.34	1.93
2119.00	11.63	97.52	2112.52	22.84 S	84.15 E	-11.41	1.44
2214.00	10.55	95.57	2205.75	24.94 S	102.30 E	-11.06	1.20
2309.00	11.11	97.85	2299.05	27.03 S	120.02 E	-10.77	0.74
2404.00	12.04	96.08	2392.12	29.33 S	138.94 E	-10.53	1.05
2499.00	11.67	94.73	2485.10	31.17 S	158.36 E	-9.76	0.49
2594.00	11.42	90.68	2578.18	32.08 S	177.34 E	-8.12	0.89
2689.00	13.23	90.91	2670.99	32.36 S	197.61 E	-5.70	1.90
2783.00	13.41	101.07	2762.47	34.63 S	219.06 E	-5.08	2.49
2878.00	13.36	100.84	2854.89	38.81 S	240.65 E	-6.34	0.08
2973.00	12.73	100.23	2947.44	42.73 S	261.73 E	-7.41	0.68
3068.00	12.37	100.08	3040.17	46.37 S	282.04 E	-8.31	0.38
3163.00	11.21	98.12	3133.16	49.45 S	301.20 E	-8.81	1.29
3257.00	11.41	96.23	3225.34	51.75 S	319.49 E	-8.65	0.45
3352.00	11.10	101.15	3318.51	54.54 S	337.80 E	-8.97	1.06
3447.00	12.86	96.87	3411.44	57.57 S	357.27 E	-9.37	2.08
3542.00	11.27	95.12	3504.34	59.67 S	377.01 E	-8.81	1.72
3636.00	11.72	102.05	3596.46	62.48 S	395.50 E	-9.13	1.55
3731.00	11.31	101.98	3689.55	66.43 S	414.05 E	-10.57	0.44
3826.00	13.73	102.83	3782.28	70.86 S	434.15 E	-12.29	2.56
3921.00	13.30	104.18	3874.65	76.05 S	455.74 E	-14.54	0.57
4016.00	11.79	101.56	3967.39	80.67 S	475.83 E	-16.44	1.70
4111.00	10.50	101.58	4060.59	84.35 S	493.82 E	-17.69	1.36
4205.00	13.06	98.69	4152.61	87.68 S	512.71 E	-18.46	2.80
4301.00	11.88	95.77	4246.34	90.31 S	533.27 E	-18.33	1.39
4396.00	11.09	96.12	4339.44	92.27 S	552.08 E	-17.76	0.83
4490.00	10.75	95.33	4431.73	94.05 S	569.80 E	-17.15	0.40
4585.00	7.75	90.11	4525.49	94.88 S	585.03 E	-15.95	3.28
4680.00	6.06	85.05	4619.80	94.46 S	596.43 E	-14.01	1.89
4774.00	5.17	77.21	4713.35	93.09 S	605.50 E	-11.45	1.24
4869.00	5.02	72.99	4807.97	90.93 S	613.66 E	-8.21	0.43
4964.00	3.88	106.45	4902.70	90.62 S	620.71 E	-6.97	2.93
5059.00	3.41	114.74	4997.51	92.72 S	626.36 E	-8.29	0.74
5154.00	0.98	151.40	5092.44	94.61 S	629.31 E	-9.77	2.83
5249.00	1.07	124.69	5187.42	95.83 S	630.43 E	-10.83	0.51
5344.00	0.59	98.51	5282.41	96.40 S	631.64 E	-11.24	0.63
5438.00	1.03	112.87	5376.40	96.80 S	632.90 E	-11.47	0.51
5533.00	1.21	88.50	5471.38	97.11 S	634.69 E	-11.53	0.53
5628.00	0.91	81.98	5566.37	96.98 S	636.43 E	-11.17	0.34

5723.00	1.70	180.99	5661.35	98.28 S	637.15 E	-12.37	2.16
5817.00	1.16	164.92	5755.32	100.59 S	637.37 E	-14.63	0.71
5912.00	0.83	153.14	5850.31	102.14 S	637.94 E	-16.08	0.40
6007.00	1.44	172.95	5945.29	103.94 S	638.39 E	-17.80	0.75
6100.00	1.25	179.86	6038.26	106.10 S	638.54 E	-19.93	0.27
6148.00	2.79	345.26	6086.25	105.50 S	638.24 E	-19.37	8.35
6195.00	8.24	353.06	6133.02	101.05 S	637.55 E	-15.05	11.68
6243.00	11.81	357.27	6180.28	92.72 S	636.90 E	-6.89	7.59
6290.00	14.14	355.34	6226.07	82.20 S	636.20 E	3.45	5.04
6338.00	15.94	355.52	6272.43	69.78 S	635.21 E	15.62	3.76
6384.00	17.56	356.61	6316.47	56.55 S	634.31 E	28.61	3.58
6479.00	31.07	2.90	6402.86	17.58 S	634.70 E	67.29	14.47
6527.00	40.47	5.25	6441.76	10.37 N	636.76 E	95.26	19.78
6574.00	44.95	3.75	6476.29	42.14 N	639.24 E	127.08	9.77
6622.00	44.86	3.10	6510.29	75.96 N	641.26 E	160.87	0.96
6669.00	46.28	359.90	6543.20	109.50 N	642.13 E	194.23	5.73
6717.00	48.93	355.07	6575.57	144.89 N	640.55 E	229.09	9.26
6763.00	53.30	353.67	6604.44	180.52 N	637.02 E	263.92	9.79
6811.00	59.41	354.90	6631.02	220.26 N	633.06 E	302.78	12.90
6858.00	66.14	355.77	6652.51	261.89 N	629.67 E	343.59	14.42
6906.00	70.67	357.14	6670.18	306.42 N	626.92 E	387.35	9.80
6953.00	73.83	359.28	6684.50	351.15 N	625.53 E	431.50	8.01
7001.00	77.02	359.54	6696.58	397.60 N	625.05 E	477.47	6.66
7065.00	83.10	359.90	6707.63	460.61 N	624.74 E	539.87	9.52

**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 7.67 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.81 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7065.00 FEET  
IS 776.19 FEET ALONG 53.60 DEGREES (GRID)**