

PCGK : Pressure Case Gamma
PCDC: Pressure Case Directional



1 : 600 / 1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	16-Aug-12	17-Aug-12	20-Aug-12		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.130		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	674.00	6,002.00	7,154.00		
Log End Depth (MD, ft)	6,062.00	7,154.00	11,208.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	15-Aug-12 12:05	16-Aug-12 16:30	18-Aug-12 12:05		
Drill/Wipe End Date and Time	16-Aug-12 09:50	17-Aug-12 10:05	19-Aug-12 17:45		
Min Inc (deg) @ Depth (MD, ft)	.15 @ 1,264.00	15.14 @ 6,052.00	84.71 @ 7,186.00		
Max Inc (deg) @ Depth (MD, ft)	16.30 @ 4,013.00	85.09 @ 7,154.00	92.90 @ 8,799.00		
Bit TFA(in2) / Bit Type	.75 / PDC	.75 / Diamond	.46 / PDC		
Flow Rate (gpm)	598.00	573.00	269.00		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.65 / 29.00	10.00 / 38.00	9.22 / 35.00		
Filtrate CL (ppm)	1,500.00	1,500.00	1,400.00		
pH / Fluid Loss (mptm)	9.10 / 0	8.90 / 0	9.30 / 0		
PV (cP) / YP (lbf2)	2 / 3.00	10 / 10.00	7 / 6.00		
% Solids / % Sand	2.6 / 0.25	12.2 / 0.25	4.6 / 0.25		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Max Tool Temp (in) @ Temp (degF)	152.10 / 324	172.70 / 321	222.40 / 321		

Max Tool Temp (degF) / Source	150.10 / PCM	172.78 / PCM	226.10 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 150.10	N/A @ 172.78	N/A @ 226.10		
Lead MWD Engineer	Paul Kock	Paul Kock	Paul Kock		
Customer Representative	Dave Neilson	Dave Neilson	Dave Neilson		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11341320	11341320	11751282		
Insert Serial Number	11680781	11680781	11680751		
Date and Time Initialized	15-Aug-12 08:42	15-Aug-12 08:42	18-Aug-12 06:10		
Date and Time Read	17-Aug-12 14:26	17-Aug-12 14:44	20-Aug-12 03:30		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	54.50	51.74	61.06		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11341320	11341320	11751282		
Sonde Serial Number	11833225	11833225	11062056		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	95.07	315.27	268.68		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.70	46.94	56.26		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11341320	11341320	11751282		
Insert/Sonde Serial Number	11681000	11681000	11680975		

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 2" (1:600) logs - 1 ft. interval, 3 ft. coercion distance.
 - All 5" (1:240) logs - .5 ft. interval, .6 ft. coercion distance.
5. INSITE version 7.3.5
6. End of Run 200. Gap between build and lateral section is due to Gamma sensor measure point to bit distance during the build run. Last Gamma datapoint is at 7107 ft. MD. Gamma cannot be measured within cased hole, and collection resumes after drilling through cement at 7154 ft MD.

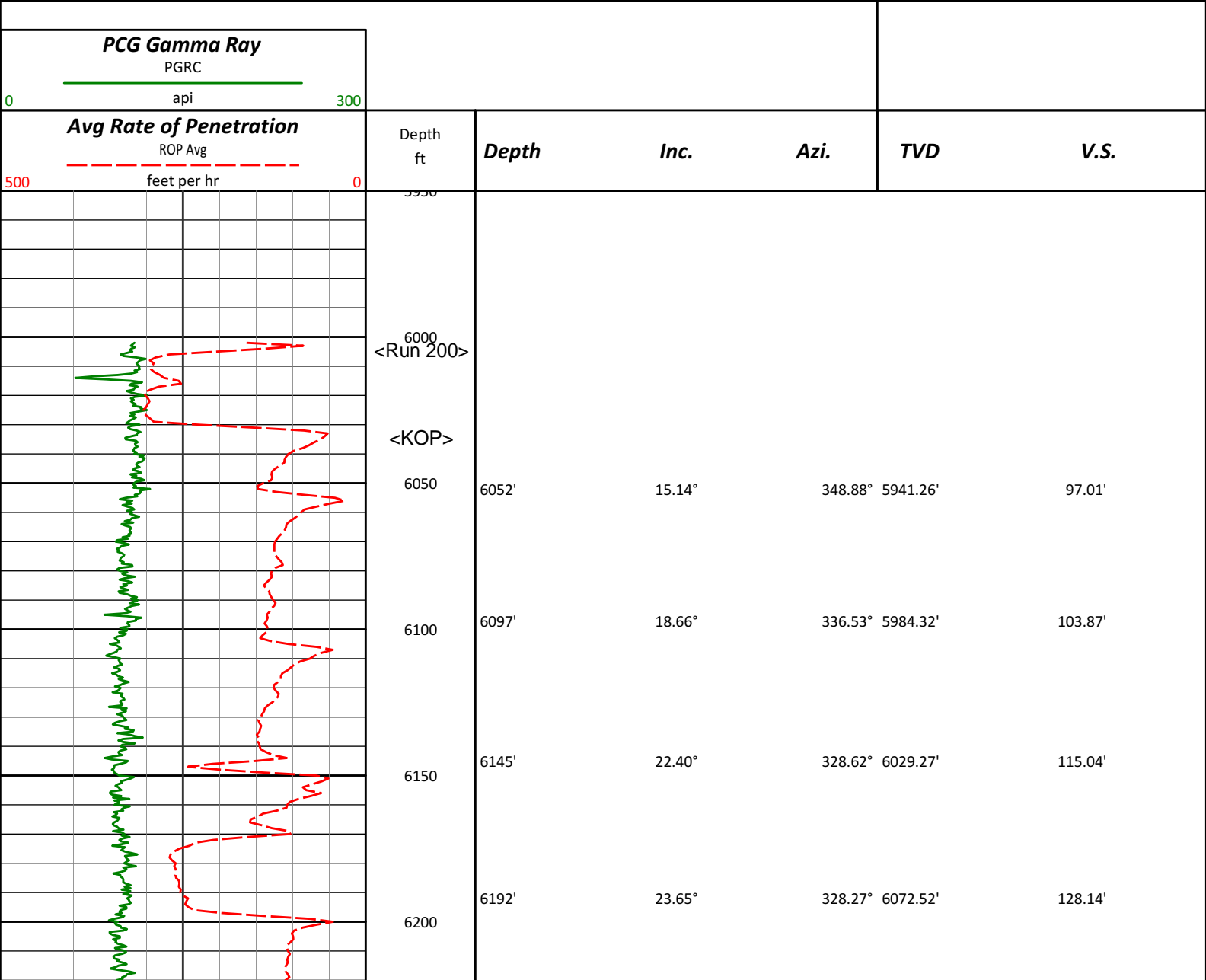
WARRANTY

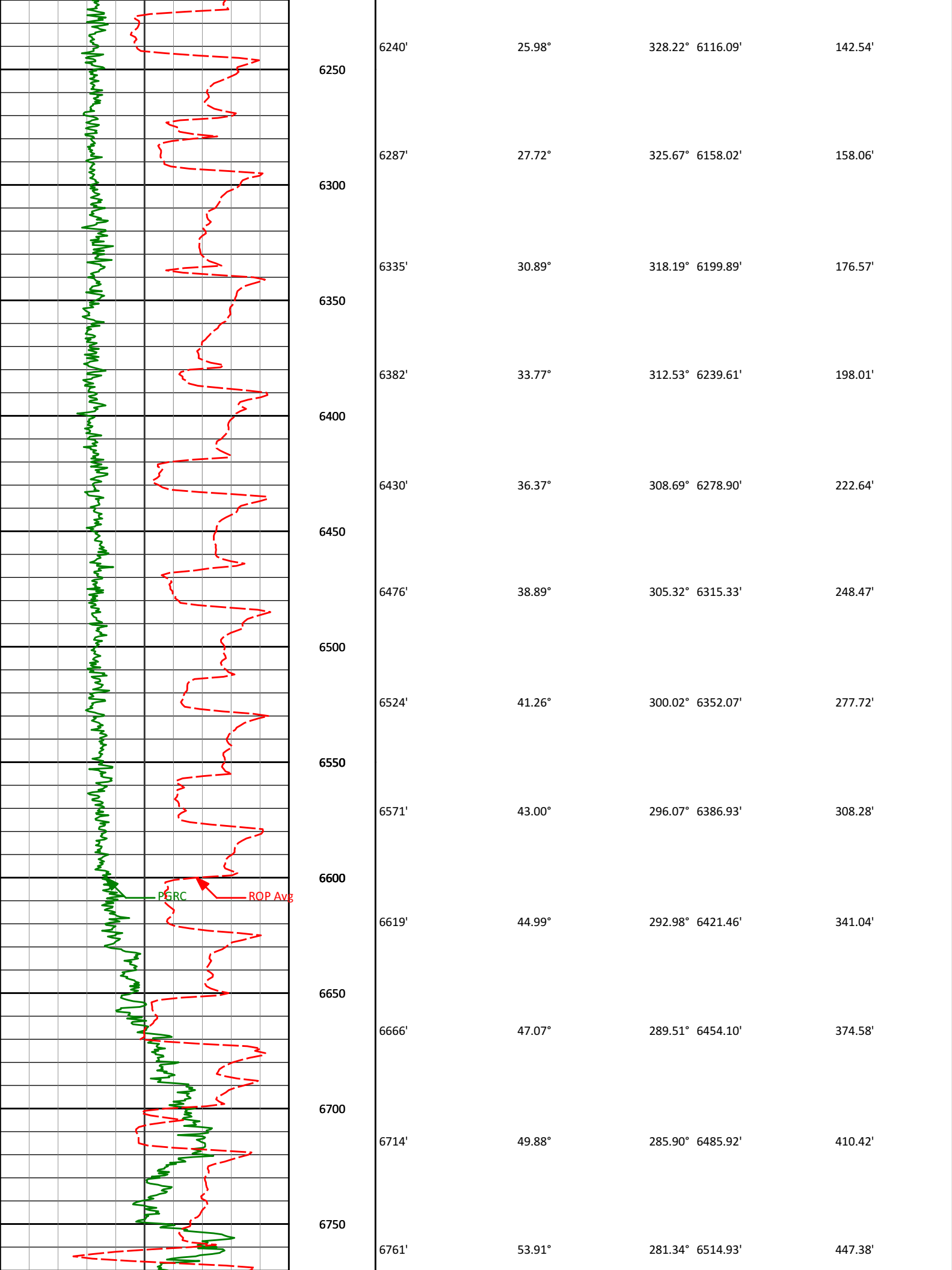
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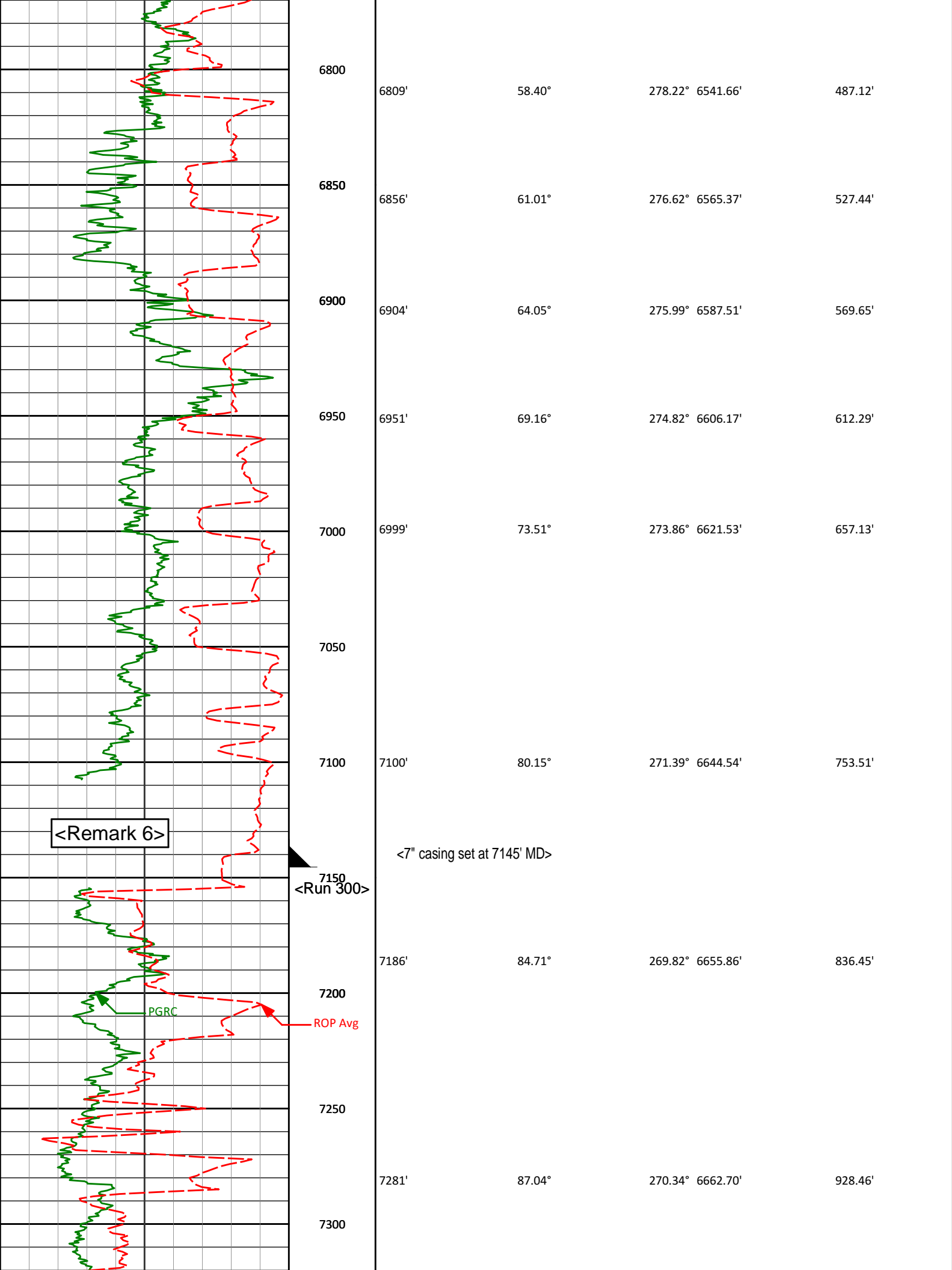
HALLIBURTON
Sperry Drilling Services

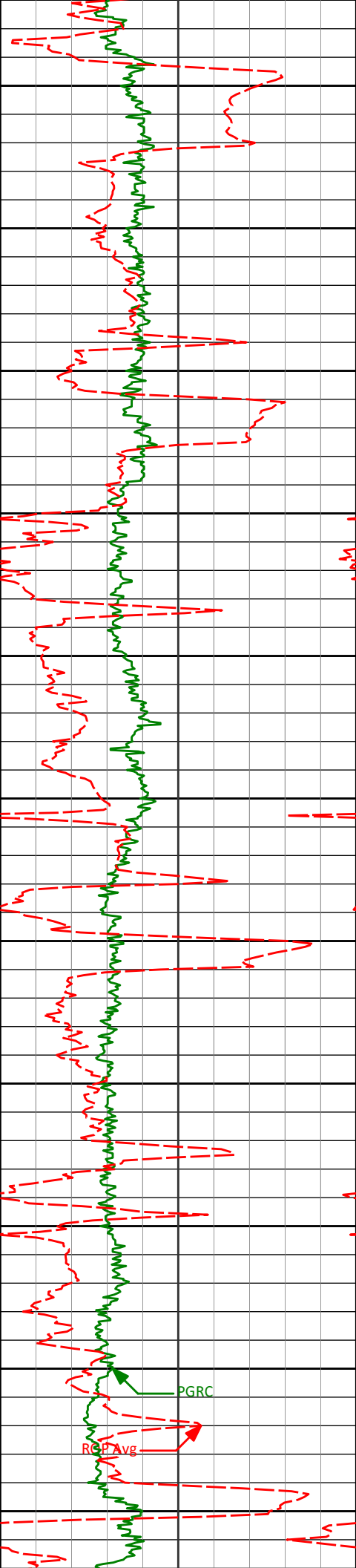
MD Main Log 1:600

Noble Energy, Inc
Wells Ranch AA12-65-1HN
H&P 315
T6N R63W









7350

7376'

90.71°

270.82° 6664.56'

1020.87'

7400

7450

7471'

89.26°

269.34° 6664.59'

1113.12'

7500

7550

7566'

91.17°

270.39° 6664.23'

1205.28'

7600

7650

7660'

89.75°

270.01° 6663.47'

1296.61'

7700

7750

7755'

90.40°

270.83° 6663.34'

1388.99'

7800

PGRC

ROG Avg

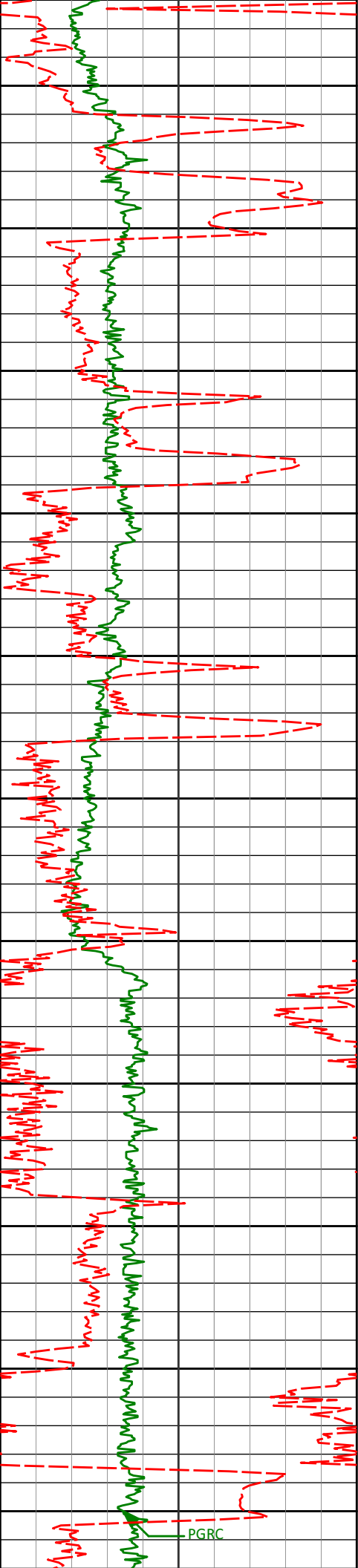
7850

7850'

91.35°

270.77° 6661.89'

1481.51'



7900

7950

8000

8050

8100

8150

8200

8250

8300

8350

8400

7945'

8040'

8135'

8230'

8324'

8419'

90.49°

88.55°

89.32°

89.38°

90.96°

86.30°

269.86° 6660.36'

268.59° 6661.15'

269.31° 6662.91'

269.79° 6663.99'

271.61° 6663.71'

267.31° 6665.98'

1573.84'

1665.74'

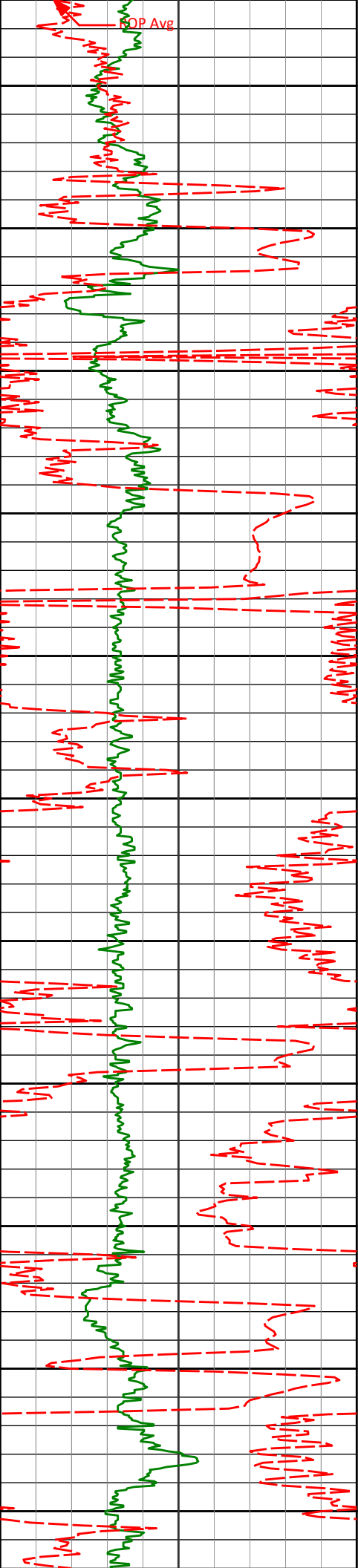
1757.51'

1849.55'

1941.06'

2032.99'

PGRC



8450

8500

8550

8600

8650

8700

8750

8800

8850

8900

8950

8514'

86.51°

268.05° 6671.93'

2124.03'

8609'

88.09°

268.36° 6676.41'

2215.39'

8704'

91.94°

271.00° 6676.38'

2307.46'

8799'

92.90°

271.50° 6672.37'

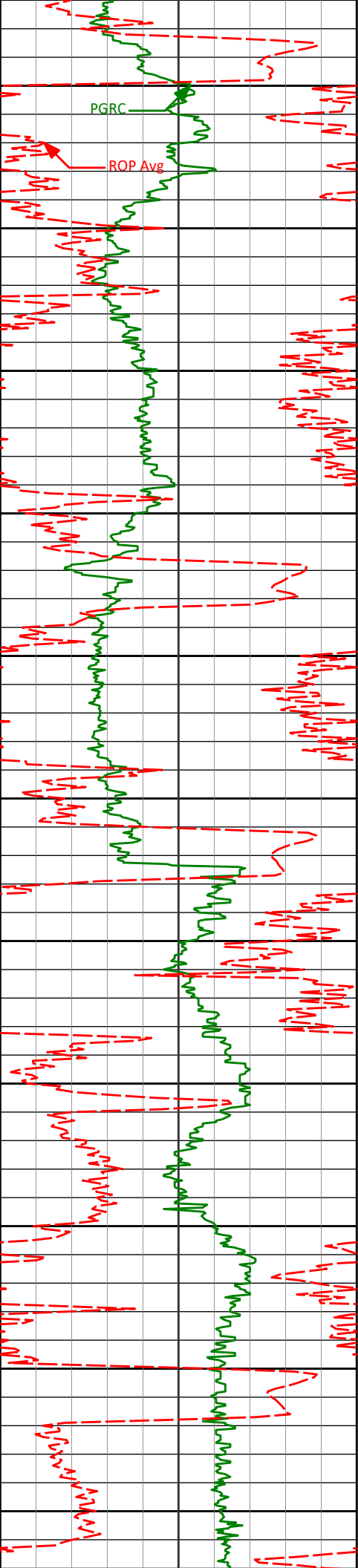
2400.07'

8894'

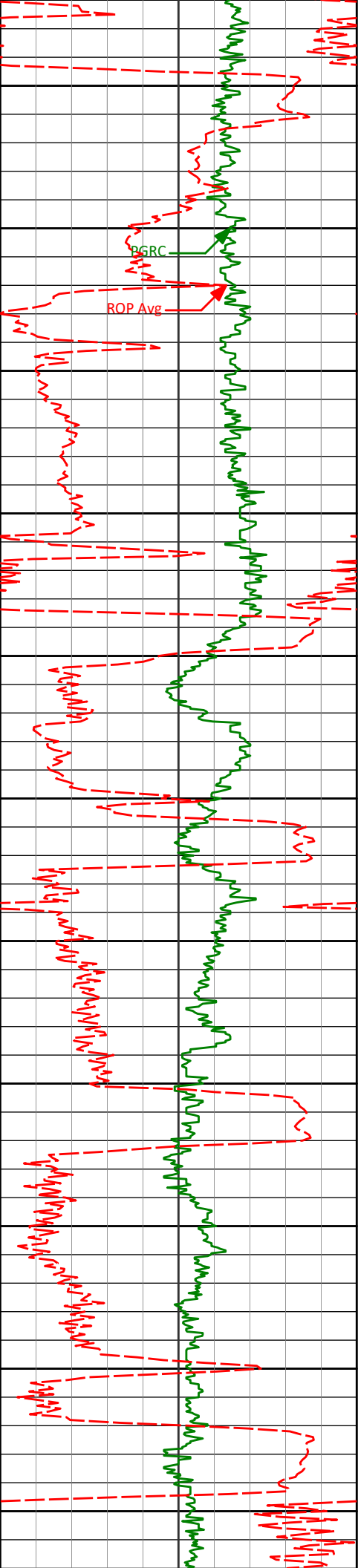
90.83°

271.12° 6669.28'

2492.73'



8989'	89.63°	269.21° 6668.90'	2585.02'
9000			
9050			
9084'	89.38°	269.25° 6669.72'	2676.92'
9100			
9150			
9178'	89.41°	268.78° 6670.70'	2767.77'
9200			
9250			
9273'	89.91°	268.40° 6671.26'	2859.40'
9300			
9350			
9368'	89.88°	268.73° 6671.44'	2951.02'
9400			
9450			
9463'	90.71°	268.58° 6670.96'	3042.68'
9500			



9550

9558'

91.51°

267.30° 6669.12'

3134.00'

9600

9650

9653'

91.23°

266.29° 6666.84'

3224.78'

9700

9750

9748'

91.30°

267.01° 6664.75'

3315.48'

9800

9850

9843'

92.47°

267.88° 6661.63'

3406.55'

9900

9950

9938'

92.25°

268.30° 6657.72'

3497.88'

10000

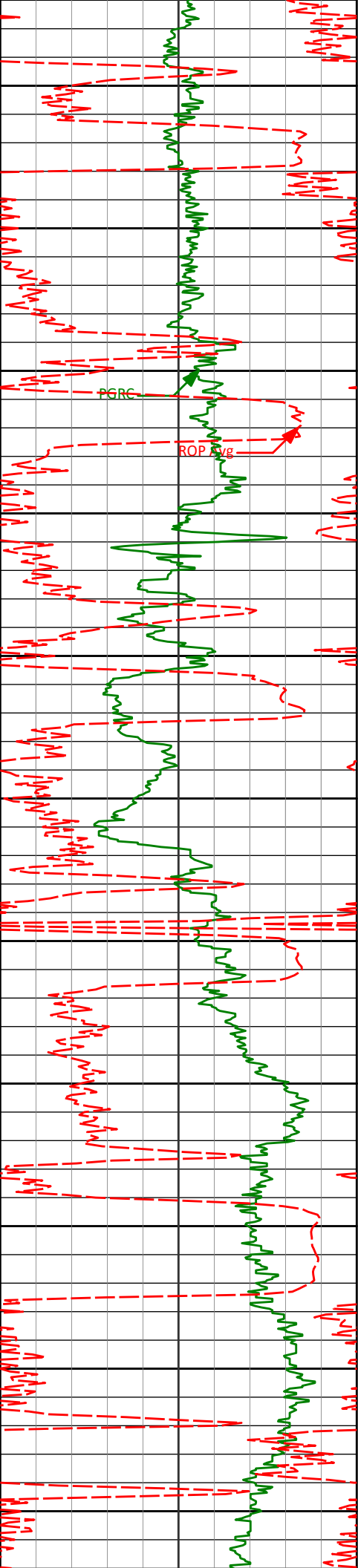
10050

10033'

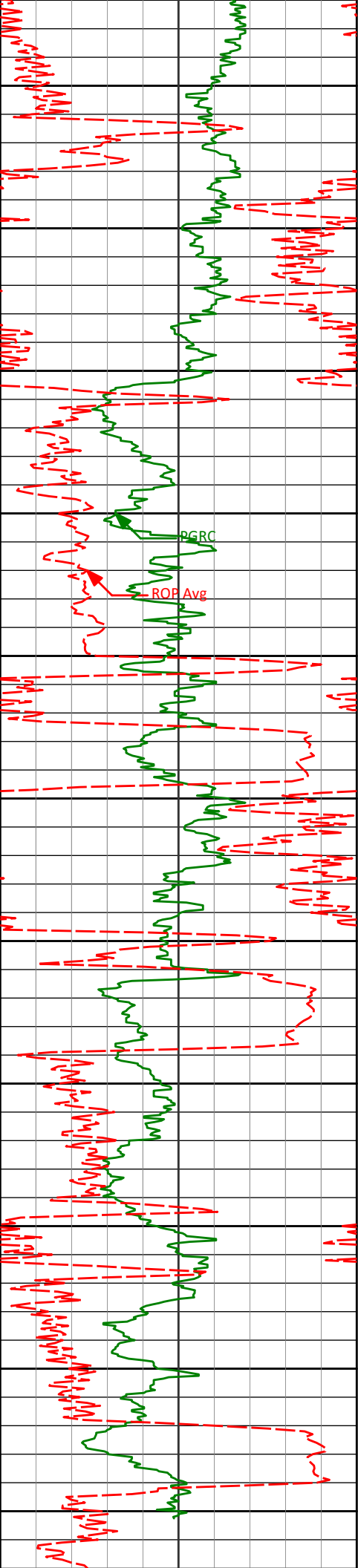
91.08°

268.81° 6654.96'

3589.46'



10100				
10128'	89.75°	267.89°	6654.27'	3680.98'
10150				
10200				
10223'	88.70°	268.79°	6655.55'	3772.49'
10250				
10300				
10318'	87.70°	269.73°	6658.54'	3864.36'
10350				
10400				
10412'	87.35°	269.94°	6662.60'	3955.46'
10450				
10500				
10507'	88.46°	270.32°	6666.08'	4047.67'
10550				
10600				
10602'	89.97°	270.46°	6667.38'	4140.04'



10650

10700

10750

10800

10850

10900

10950

11000

11050

11100

11150

10697'

90.06°

270.13° 6667.36'

4232.37'

10792'

91.36°

269.15° 6666.18'

4324.44'

10887'

92.65°

269.05° 6662.86'

4416.24'

10982'

90.46°

269.16° 6660.27'

4508.05'

11145'

91.63°

269.53° 6657.29'

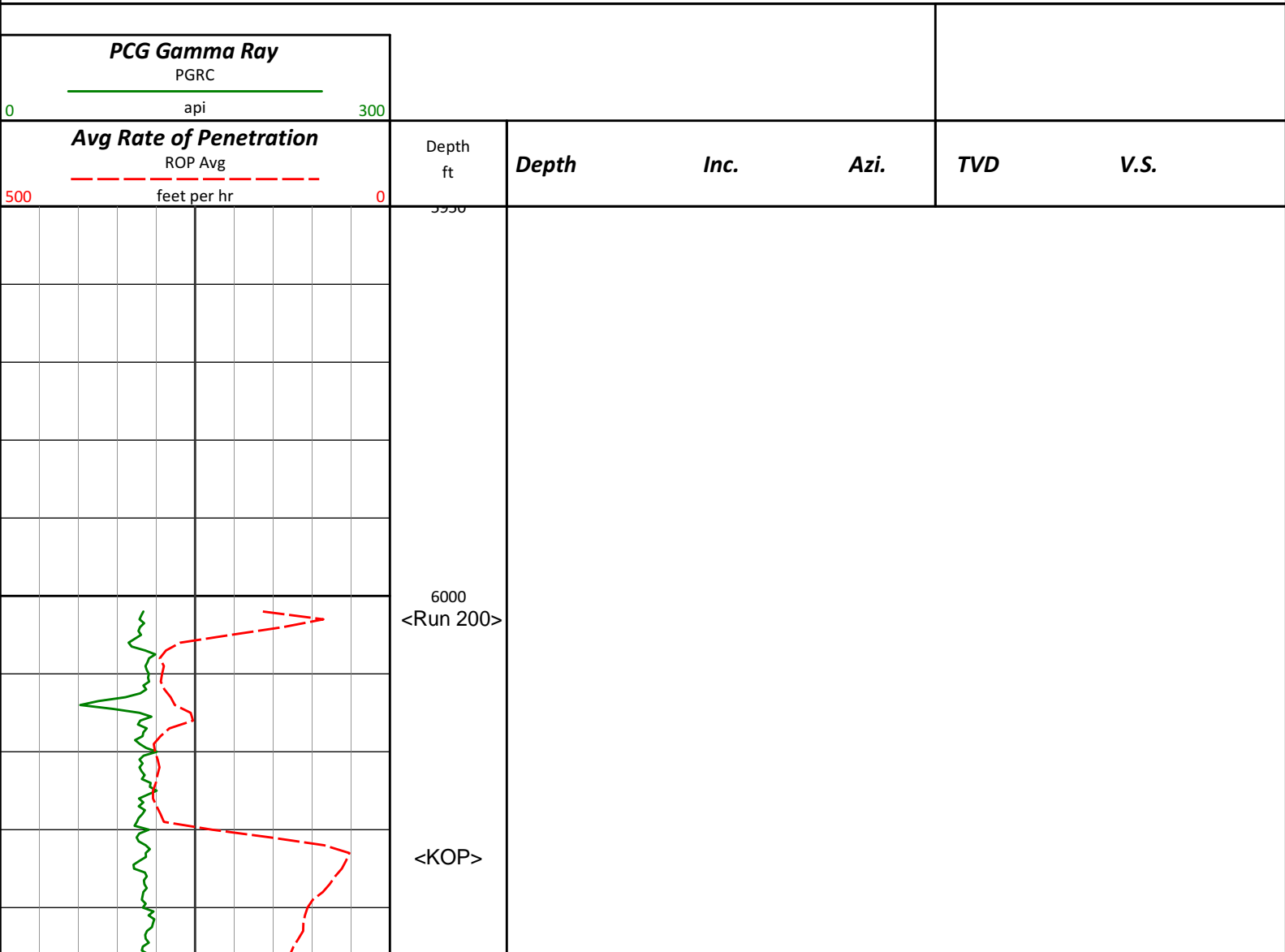
4665.80'

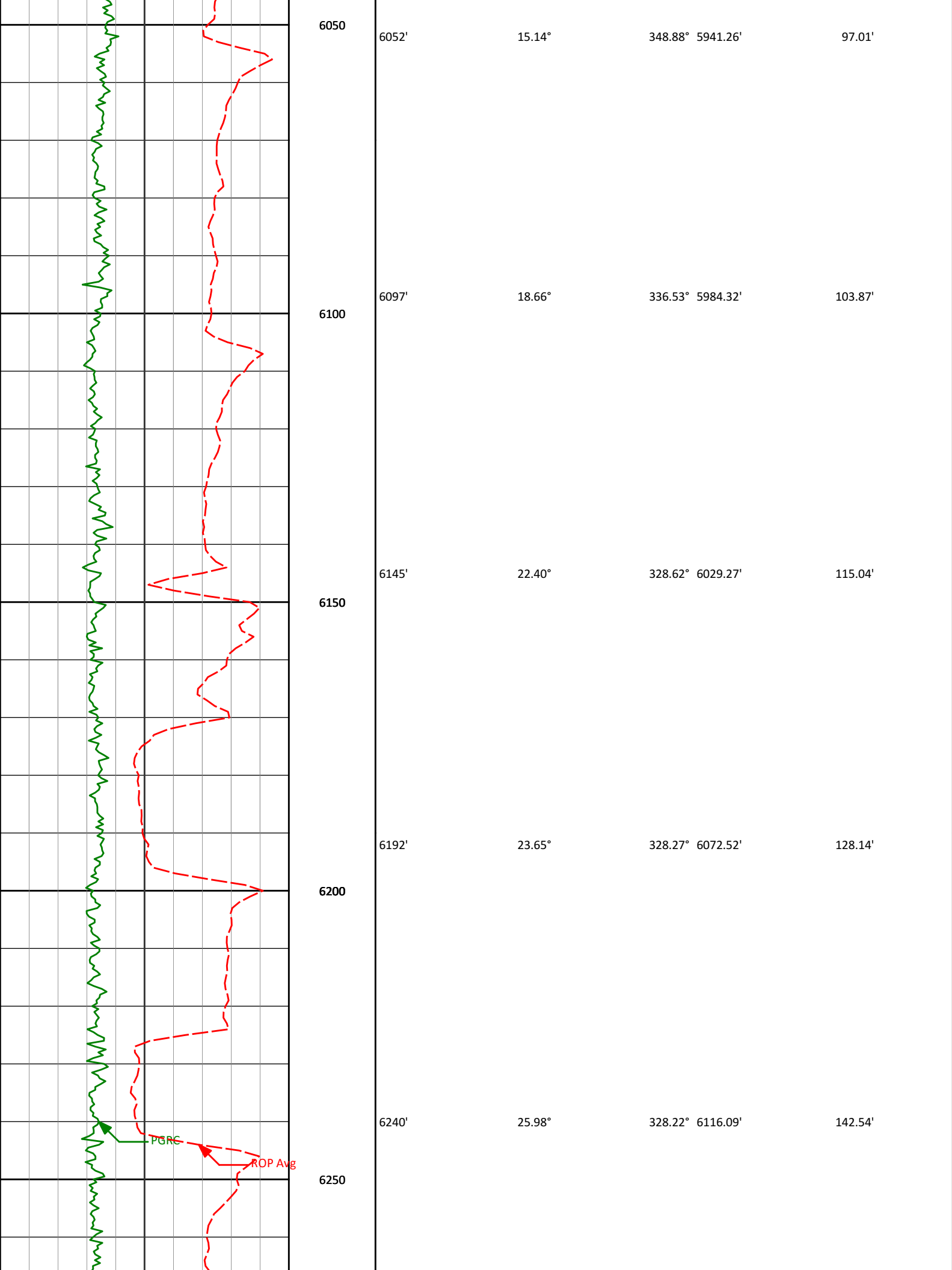


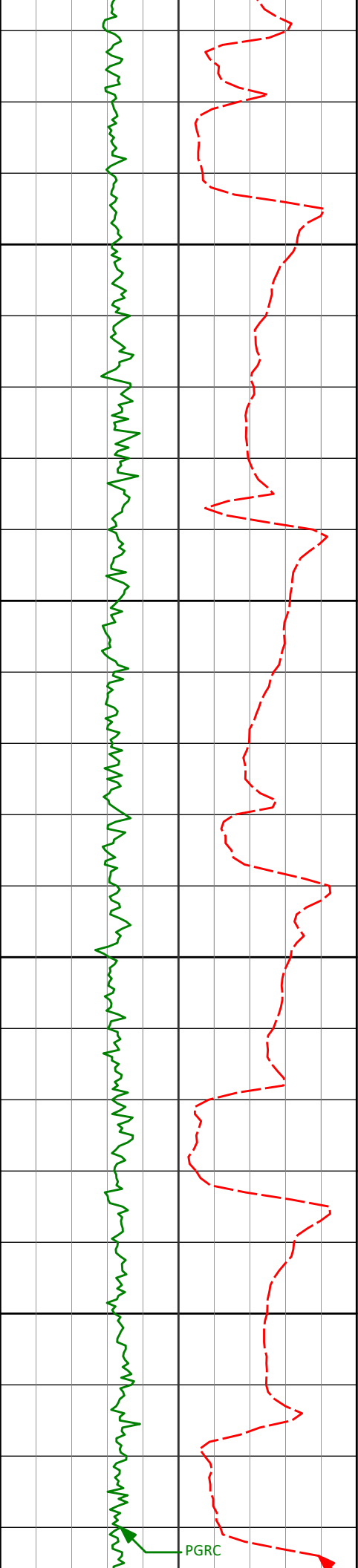
Avg Rate of Penetration ROP Avg feet per hr		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
PCG Gamma Ray PGRC api							

HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

Noble Energy, Inc
Wells Ranch AA12-65-1HN
H&P 315
T6N R63W







6300

6287'

27.72°

325.67° 6158.02'

158.06'

6335'

30.89°

318.19° 6199.89'

176.57'

6350

6382'

33.77°

312.53° 6239.61'

198.01'

6400

6430'

36.37°

308.69° 6278.90'

222.64'

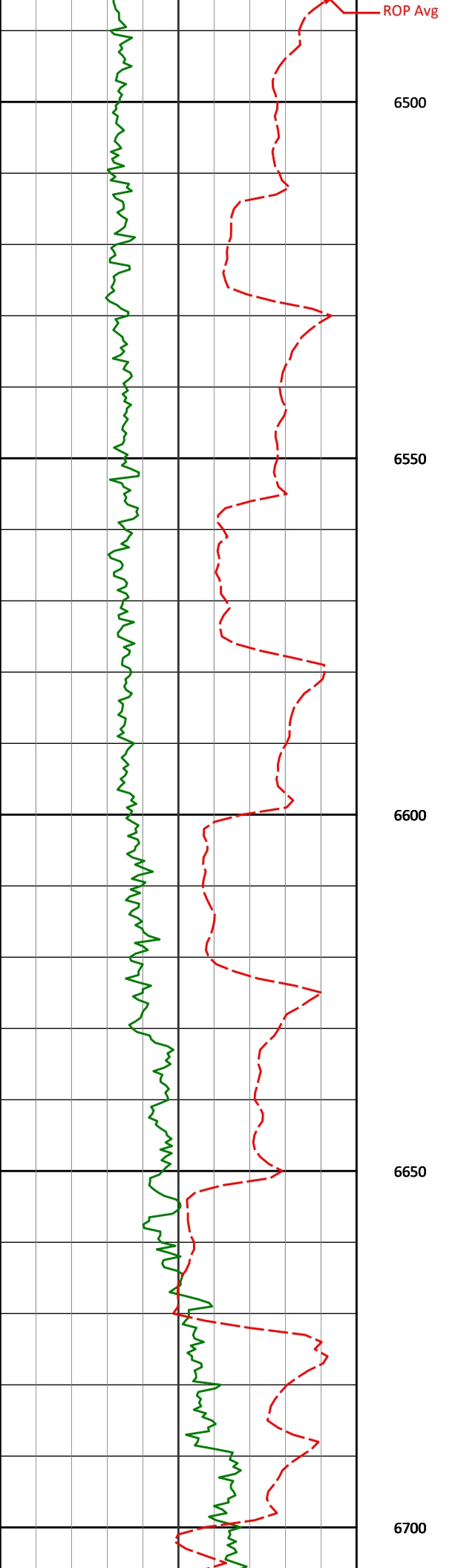
6450

6476'

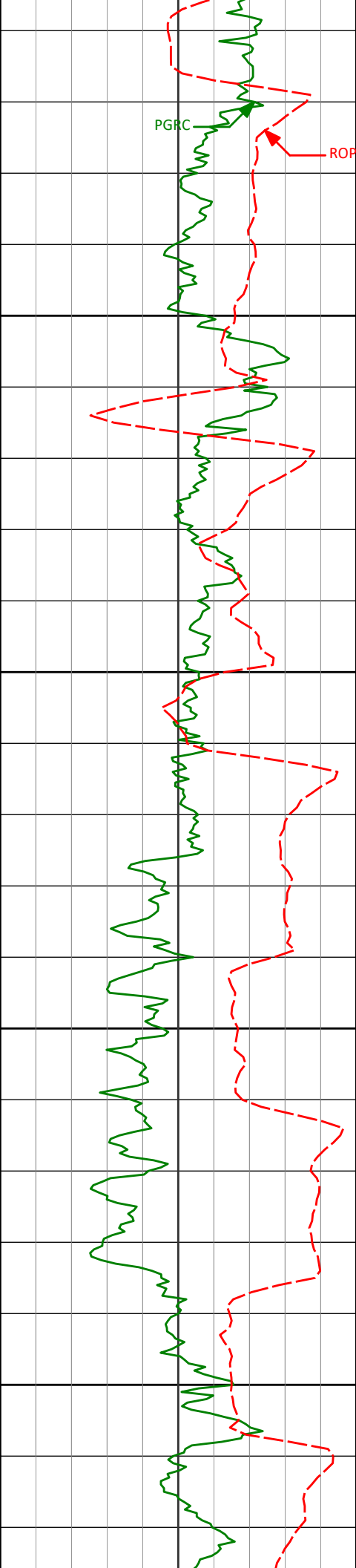
38.89°

305.32° 6315.33'

248.47'



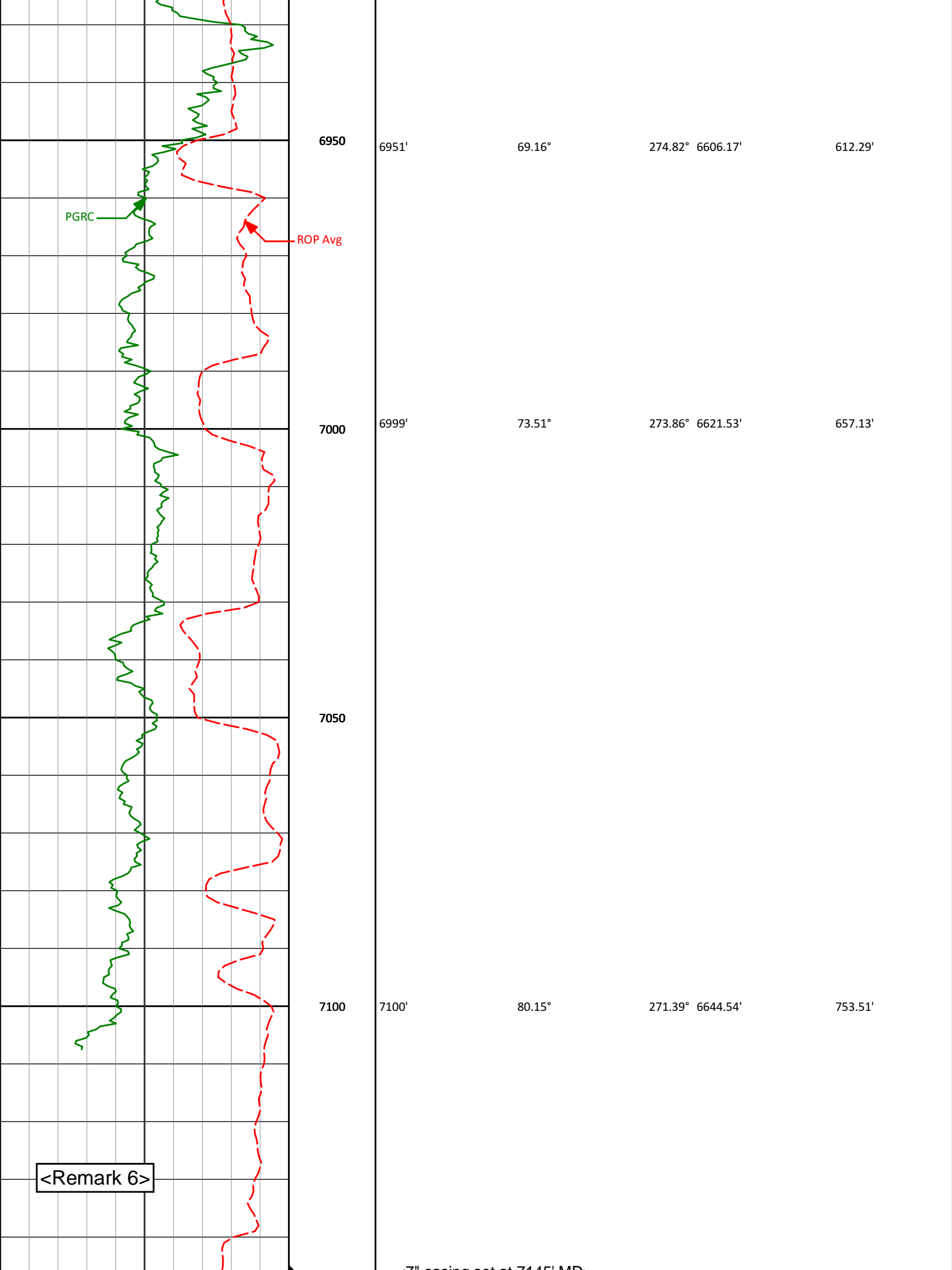
6500				
6524'	41.26°	300.02°	6352.07'	277.72'
6550				
6571'	43.00°	296.07°	6386.93'	308.28'
6600				
6619'	44.99°	292.98°	6421.46'	341.04'
6650				
6666'	47.07°	289.51°	6454.10'	374.58'
6700				

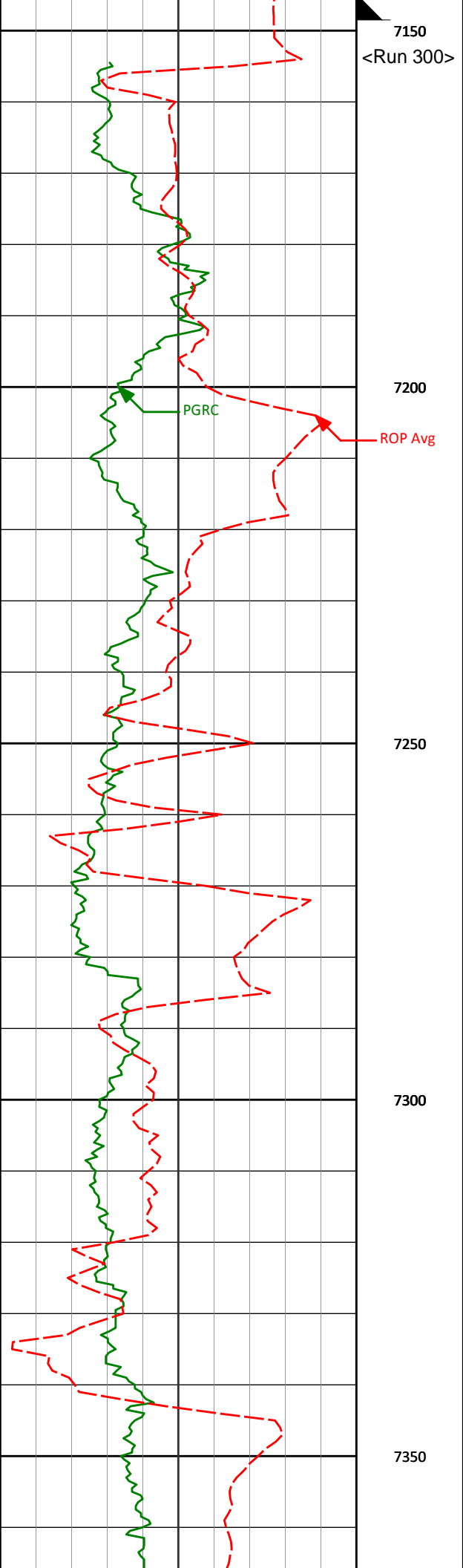


6750

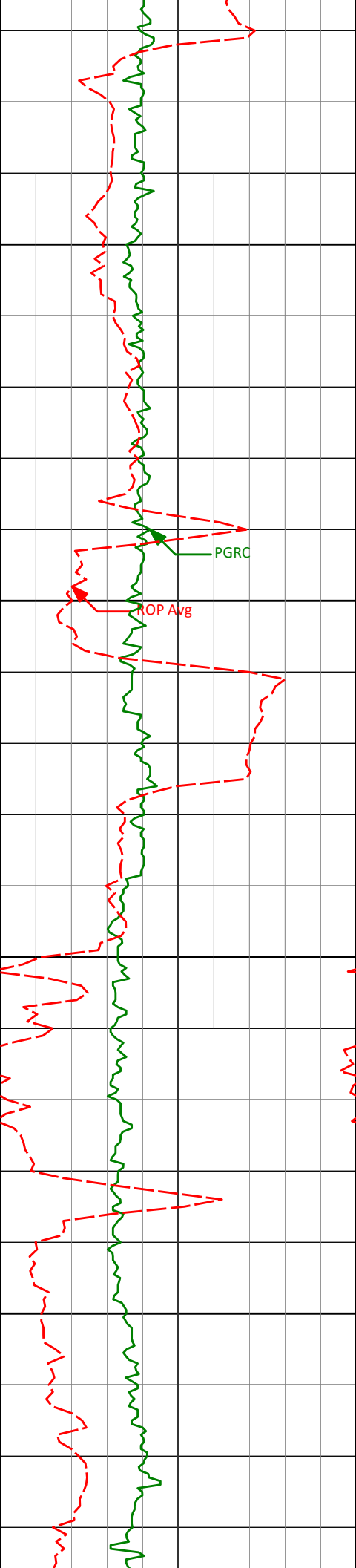
6900

6714'	49.88°	285.90°	6485.92'	410.42'
6761'	53.91°	281.34°	6514.93'	447.38'
6809'	58.40°	278.22°	6541.66'	487.12'
6856'	61.01°	276.62°	6565.37'	527.44'
6904'	64.05°	275.99°	6587.51'	569.65'





<7" casing set at 7145 MD>			
7186'	84.71°	269.82° 6655.86'	836.45'
7281'	87.04°	270.34° 6662.70'	928.46'



7376'

90.71°

270.82° 6664.56'

1020.87'

7400

7450

7471'

89.26°

269.34° 6664.59'

1113.12'

7500

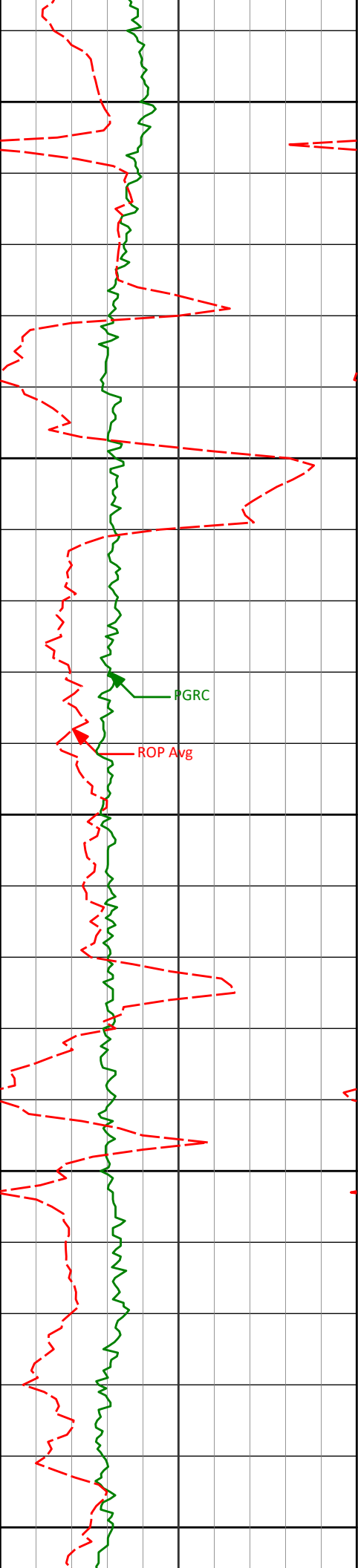
7550

7566'

91.17°

270.39° 6664.23'

1205.28'



7600

7650

7700

7750

7800

7660'

89.75°

270.01° 6663.47'

1296.61'

GRC

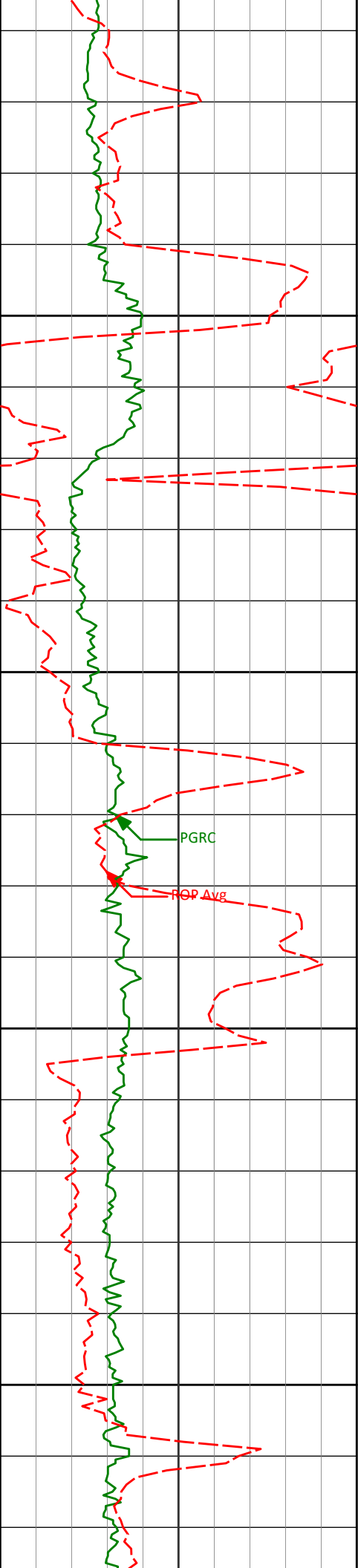
ROP Avg

7755'

90.40°

270.83° 6663.34'

1388.99'



7850

7850'

91.35°

270.77° 6661.89'

1481.51'

7900

PGRC

ROP Avg

7950

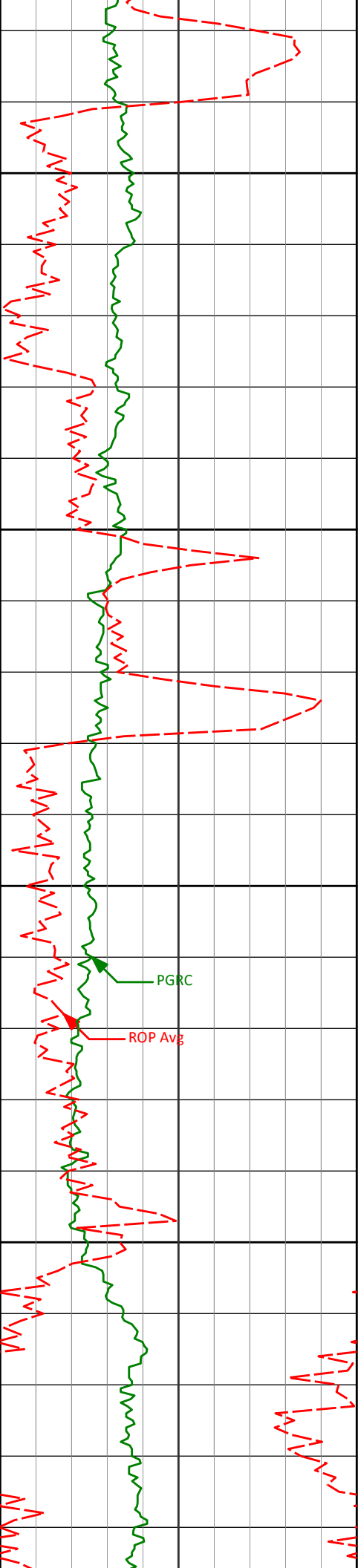
7945'

90.49°

269.86° 6660.36'

1573.84'

8000



8040'

88.55°

268.59° 6661.15'

1665.74'

8050

8100

8135'

89.32°

269.31° 6662.91'

1757.51'

8150

PGRC

ROP Avg

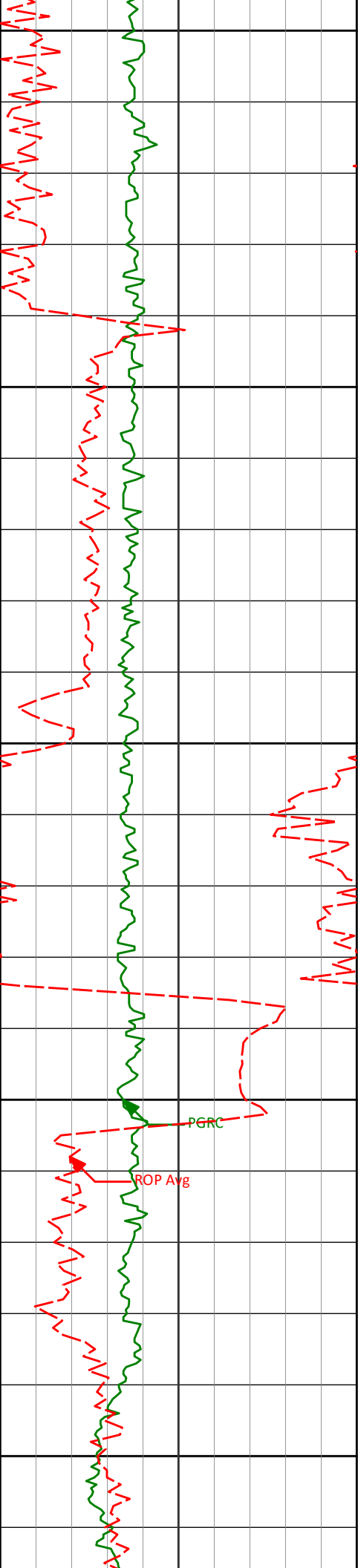
8200

8230'

89.38°

269.79° 6663.99'

1849.55'



8250

8300

8324'

90.96°

271.61° 6663.71'

1941.06'

8350

8400

ROP Avg

PGRC

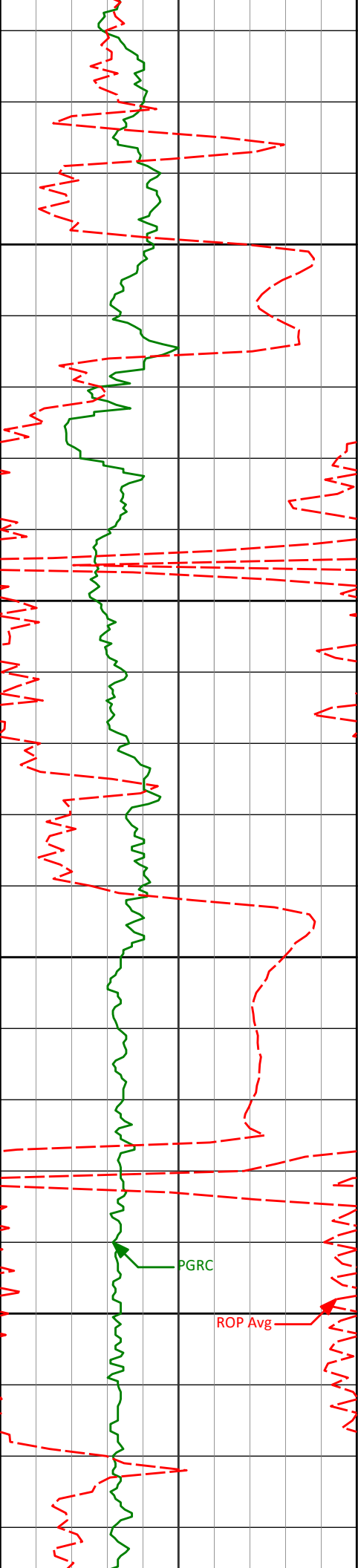
8419'

86.30°

267.31° 6665.98'

2032.99'

8450



8500

8514'

86.51°

268.05° 6671.93'

2124.03'

8550

8600

8609'

88.09°

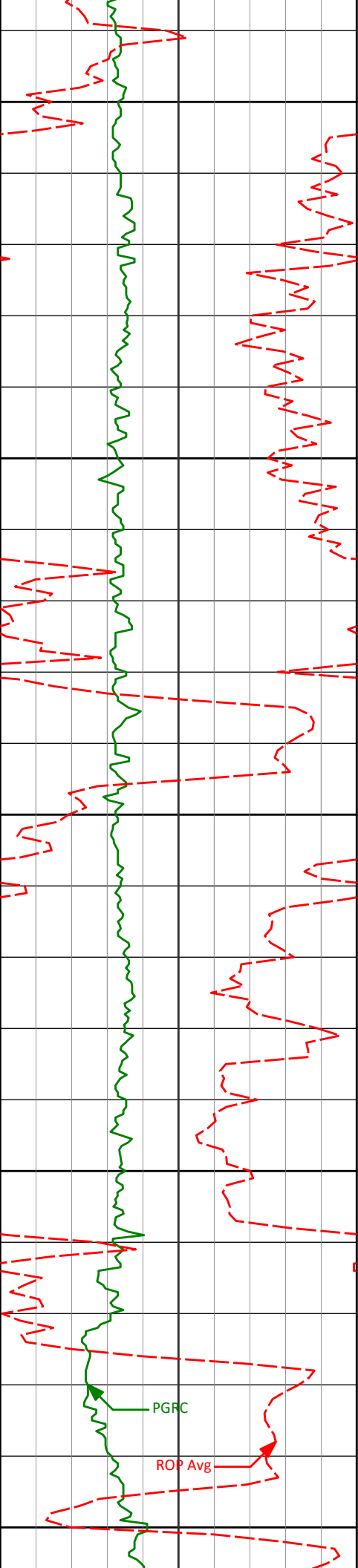
268.36° 6676.41'

2215.39'

PGRC

ROP Avg

8650



8700

8704'

91.94°

271.00° 6676.38'

2307.46'

8750

8800

8799'

92.90°

271.50° 6672.37'

2400.07'

8850

8900

8894'

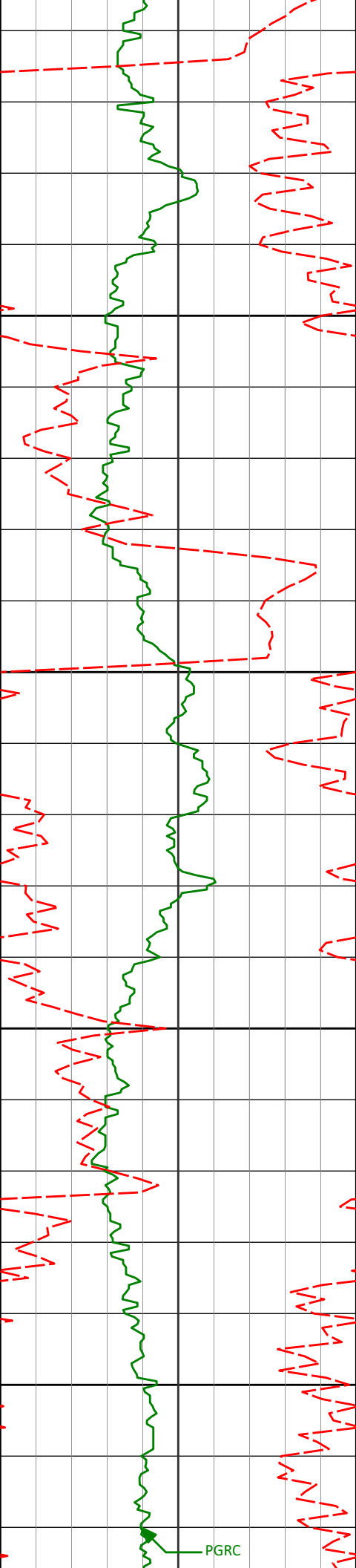
90.83°

271.12° 6669.28'

2492.73'

PGRC

ROP Avg



8950

8989'

89.63°

269.21° 6668.90'

2585.02'

9000

9050

9084'

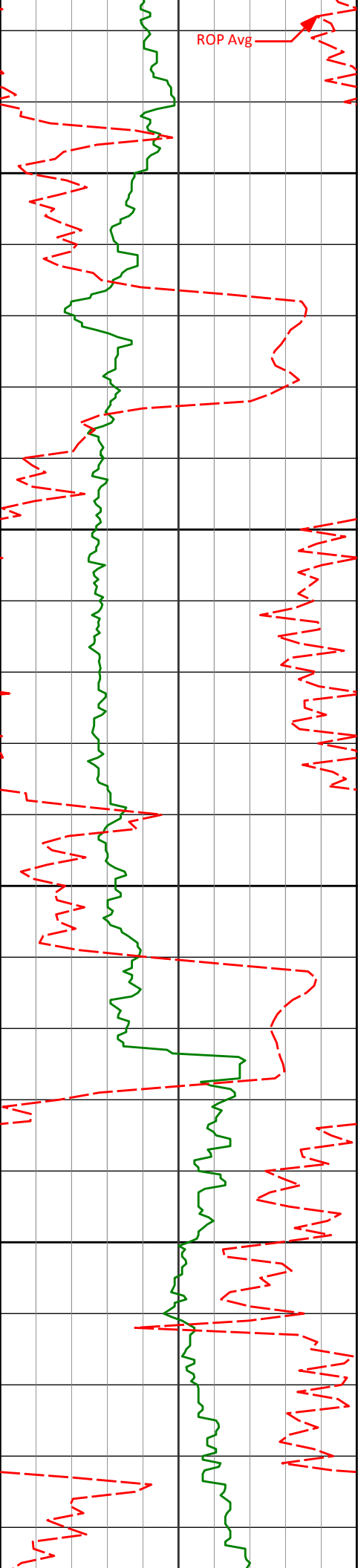
89.38°

269.25° 6669.72'

2676.92'

9100

PGRC



9150

9178'

89.41°

268.78° 6670.70'

2767.77'

9200

9250

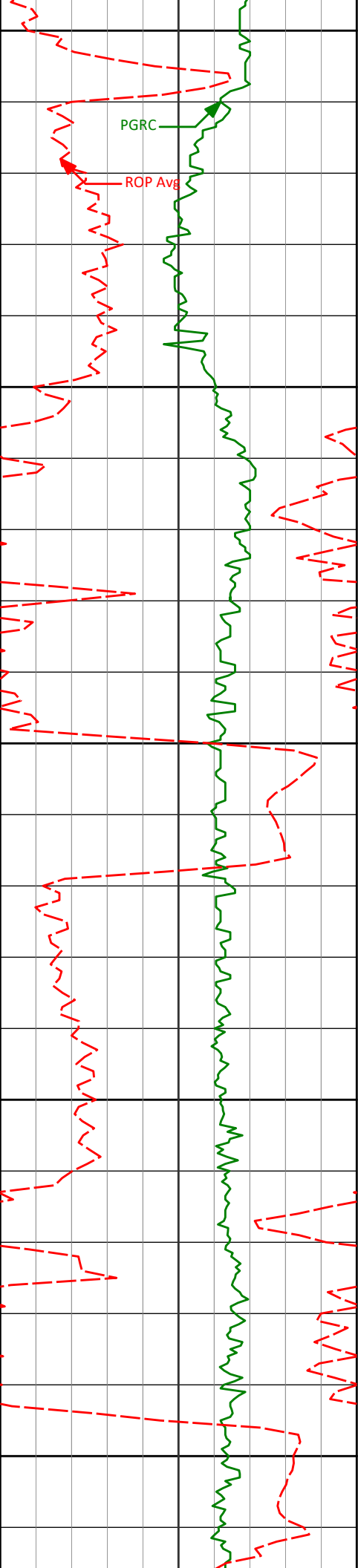
9273'

89.91°

268.40° 6671.26'

2859.40'

9300

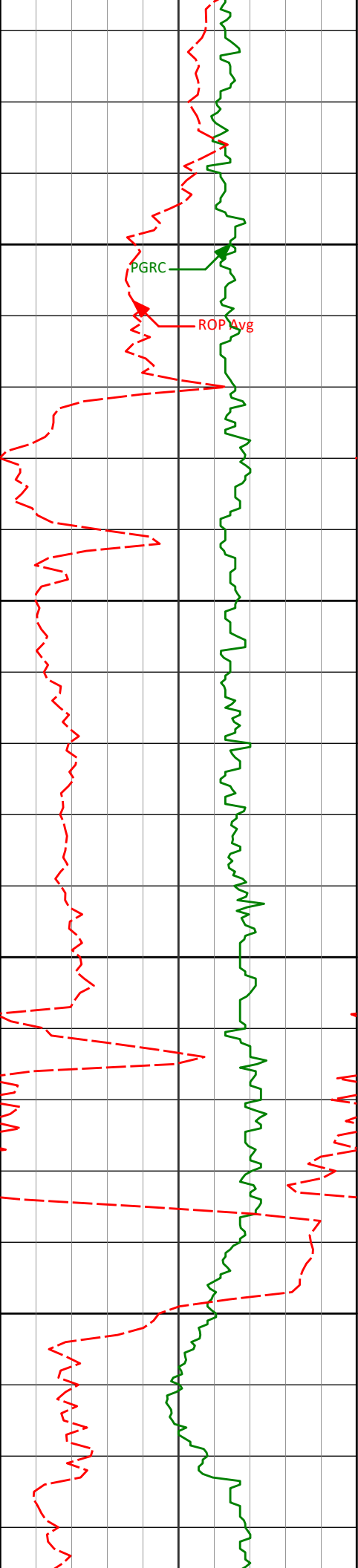


9350
9368'
9400
9450
9463'
9500
9550
9558'

89.88°
90.71°
91.51°

268.73° 6671.44'
268.58° 6670.96'
267.30° 6669.12'

2951.02'
3042.68'
3134.00'



9600

PGRC

ROP Avg

9650

9653'

91.23°

266.29° 6666.84'

3224.78'

9700

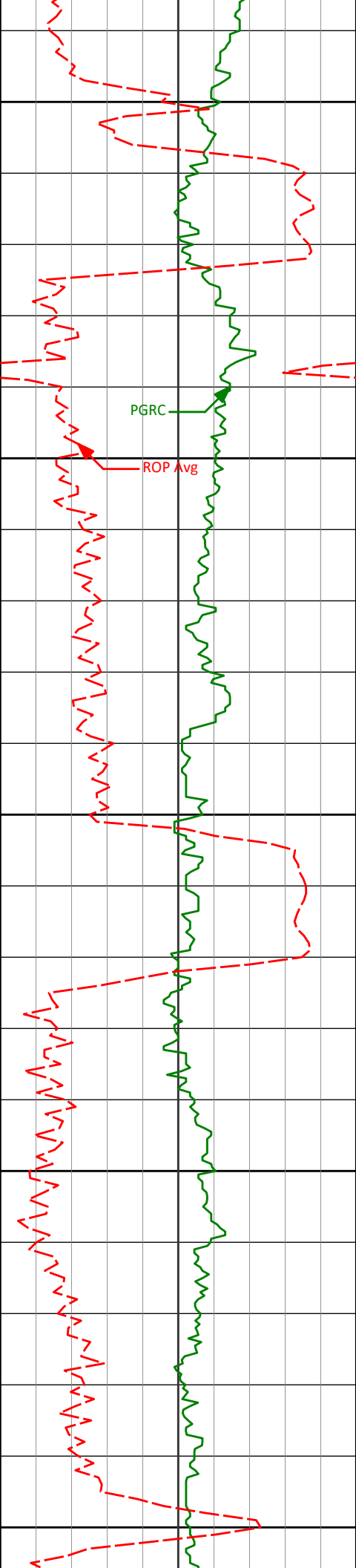
9750

9748'

91.30°

267.01° 6664.75'

3315.48'



9800

9843'

92.47°

267.88° 6661.63'

3406.55'

9850

9900

9938'

92.25°

268.30° 6657.72'

3497.88'

9950

10000



10033'

91.08°

268.81° 6654.96'

3589.46'

10050

PGRC

ROP Avg

10100

10128'

89.75°

267.89° 6654.27'

3680.98'

10150

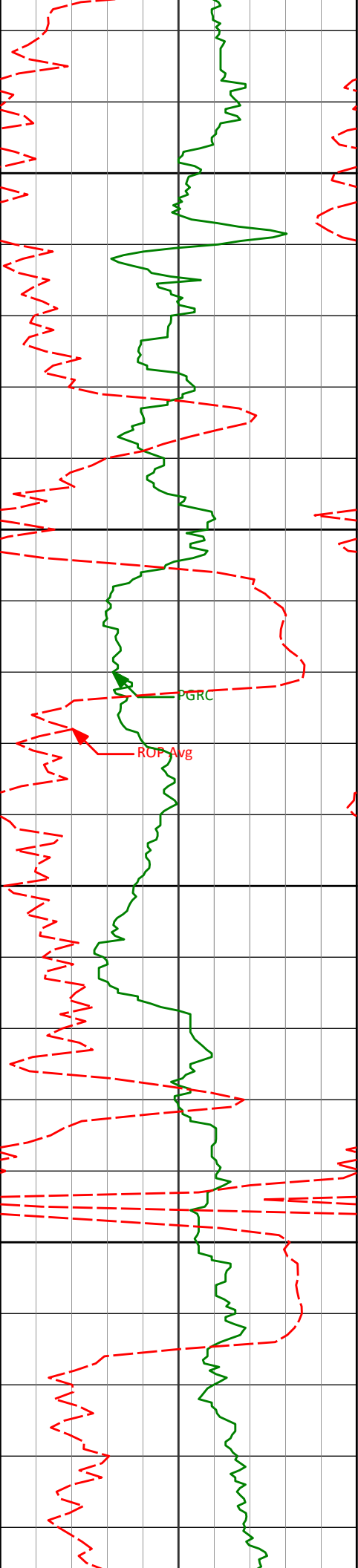
10200

10223'

88.70°

268.79° 6655.55'

3772.49'



10250

10300

10350

10400

10318'

87.70°

269.73° 6658.54'

3864.36'

ROP Avg

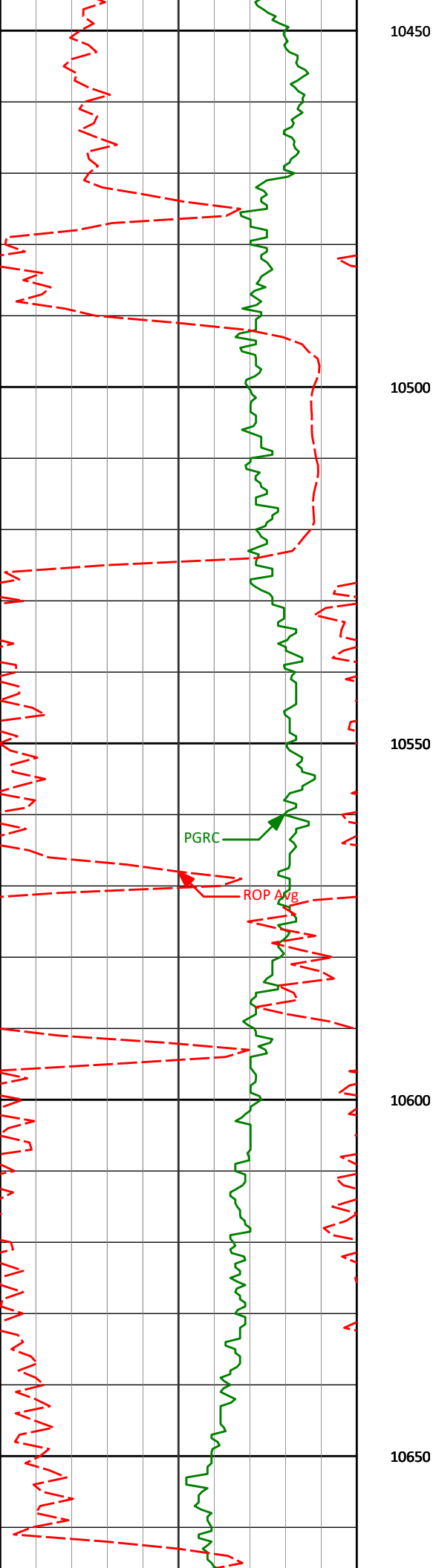
GRC

10412'

87.35°

269.94° 6662.60'

3955.46'



10507'

88.46°

270.32° 6666.08'

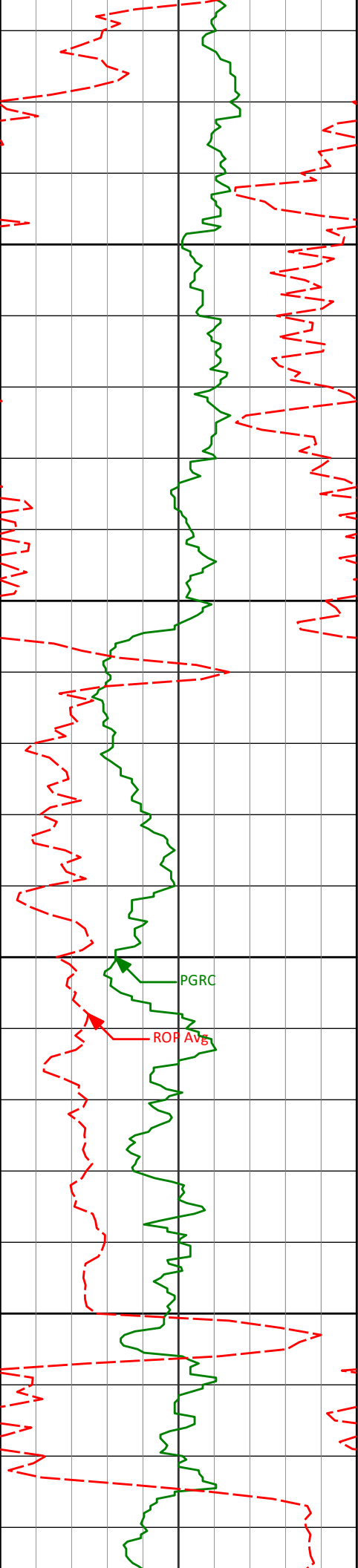
4047.67'

10602'

89.97°

270.46° 6667.38'

4140.04'



10700

10750

10800

10850

10697'

90.06°

270.13° 6667.36'

4232.37'

10792'

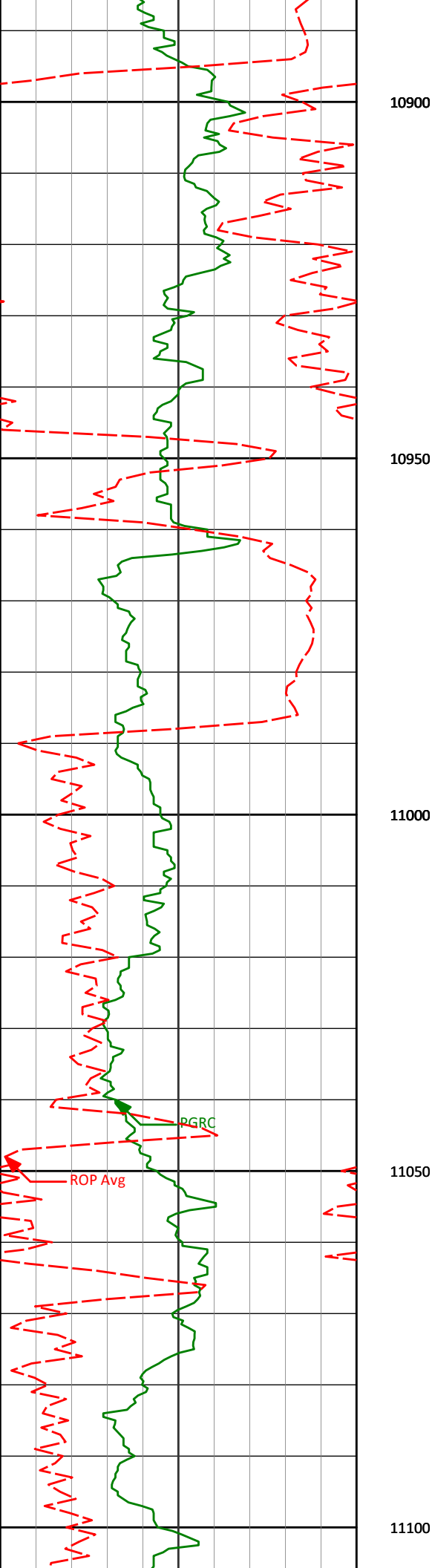
91.36°

269.15° 6666.18'

4324.44'

PGRC

ROP AVG



10887'

 92.65°

269.05° 6662.86'

4416.24'

10900

10950

11000

11050

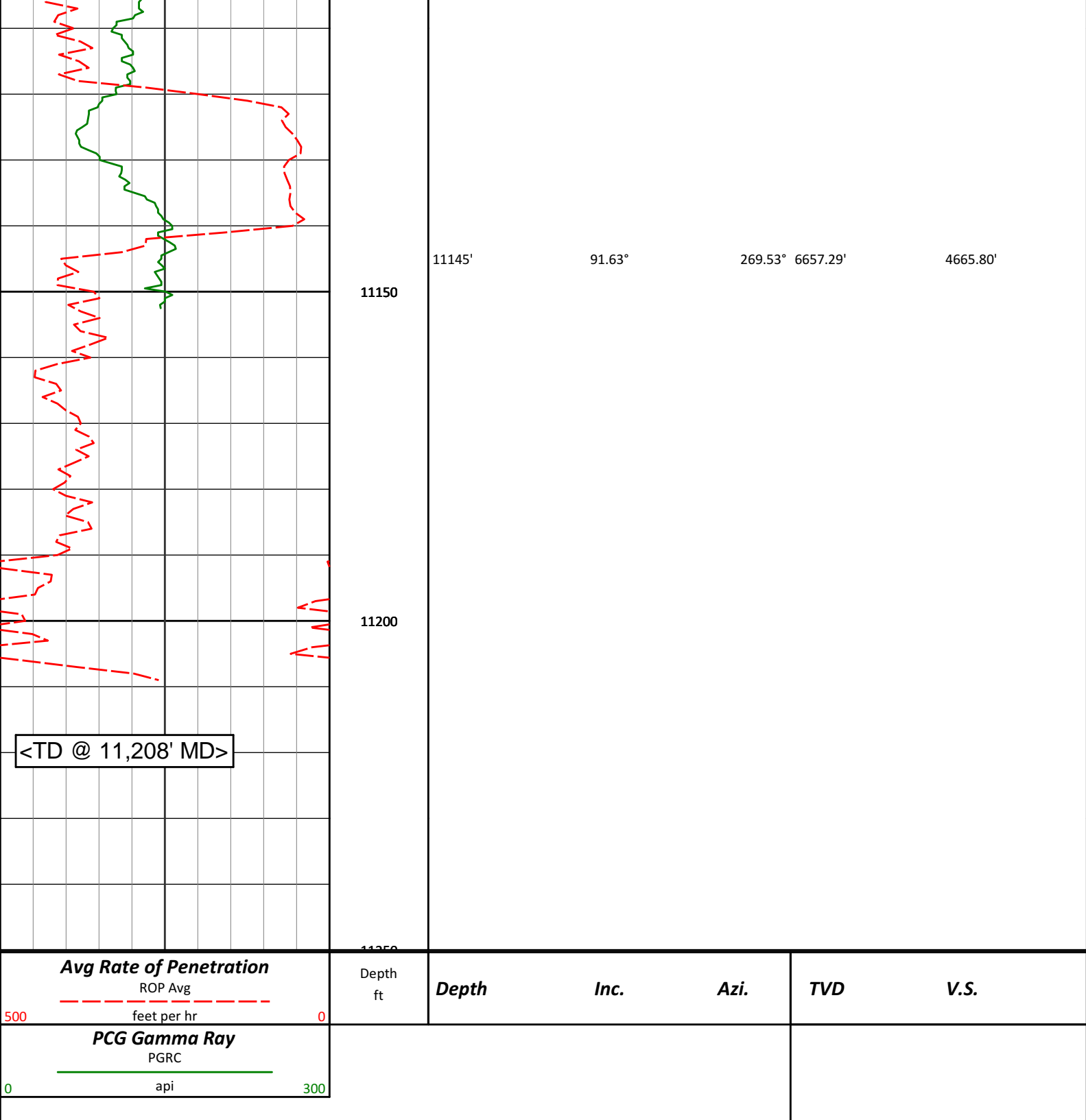
11100

10982'

90.46°

269.16° 6660.27'

4508.05'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

**Noble Energy
Wells Ranch AA12-65-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0009680581**

Survey depth 664 ft created to tie the surveys onto bottom of the surface casing shoe.

Last survey is a projection to TD.

<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>
664.00	0.00	0.00	664.00	0.00 N	0.00 E	0.00	TIE-IN
708.00	0.22	268.74	708.00	0.00 S	0.09 W	0.08	0.51
987.00	0.24	255.50	987.00	0.16 S	1.20 W	1.12	0.02
1264.00	0.15	250.96	1264.00	0.43 S	2.11 W	1.95	0.03
1546.00	0.45	231.53	1545.99	1.25 S	3.35 W	2.95	0.11
1736.00	0.60	275.85	1735.98	1.61 S	4.92 W	4.39	0.22
1831.00	1.71	341.11	1830.97	0.22 S	5.88 W	5.65	1.64
1925.00	4.00	9.67	1924.85	4.34 N	5.78 W	6.65	2.79
2020.00	6.17	9.96	2019.47	12.63 N	4.34 W	7.25	2.29
2115.00	6.42	19.36	2113.90	22.68 N	1.70 W	7.09	1.11
2210.00	8.52	26.27	2208.09	34.00 N	3.18 E	5.08	2.40
2305.00	9.99	19.41	2301.85	48.08 N	9.03 E	2.78	1.93
2400.00	11.80	15.25	2395.14	65.23 N	14.33 E	1.75	2.08
2495.00	13.20	7.92	2487.89	85.35 N	18.38 E	2.65	2.22
2590.00	13.82	7.17	2580.26	107.34 N	21.29 E	5.11	0.68
2685.00	14.50	5.38	2672.37	130.45 N	23.82 E	8.19	0.86
2780.00	12.96	5.26	2764.65	152.90 N	25.91 E	11.55	1.62
2874.00	13.45	7.60	2856.17	174.24 N	28.32 E	14.33	0.77
2969.00	14.21	11.40	2948.41	196.62 N	32.09 E	16.05	1.25
3064.00	14.61	10.25	3040.43	219.84 N	36.52 E	17.32	0.51
3159.00	14.05	9.73	3132.47	242.99 N	40.61 E	18.91	0.60
3254.00	13.26	10.17	3224.78	265.09 N	44.48 E	20.46	0.84
3349.00	13.39	12.36	3317.23	286.56 N	48.76 E	21.46	0.55
3444.00	13.15	12.78	3409.69	307.85 N	53.51 E	21.96	0.27
3538.00	12.57	10.93	3501.33	328.32 N	57.81 E	22.69	0.76
3633.00	12.76	8.97	3594.02	348.83 N	61.41 E	24.13	0.49
3728.00	14.09	9.36	3686.42	370.60 N	64.92 E	25.94	1.41
3823.00	14.73	9.71	3778.43	393.92 N	68.84 E	27.73	0.67
3918.00	15.57	9.95	3870.13	418.38 N	73.08 E	29.49	0.89
4013.00	16.30	9.78	3961.48	444.07 N	77.55 E	31.32	0.77
4108.00	15.23	8.52	4052.91	469.54 N	81.66 E	33.45	1.18
4203.00	14.52	7.56	4144.72	493.69 N	85.08 E	35.93	0.79
4298.00	13.36	6.72	4236.92	516.40 N	87.93 E	38.61	1.24
4392.00	13.35	4.63	4328.38	538.00 N	90.08 E	41.71	0.51
4487.00	13.26	2.58	4420.83	559.82 N	91.45 E	45.61	0.51
4582.00	13.11	1.70	4513.33	581.47 N	92.26 E	50.02	0.26
4677.00	12.68	4.39	4605.93	602.64 N	93.38 E	54.02	0.78
4772.00	12.23	6.58	4698.70	623.03 N	95.33 E	57.02	0.69
4867.00	12.84	5.66	4791.43	643.52 N	97.52 E	59.81	0.68
4962.00	13.91	3.82	4883.86	665.43 N	99.33 E	63.32	1.21
5057.00	14.65	9.33	4975.92	688.68 N	102.04 E	66.27	1.63
5151.00	13.66	8.94	5067.07	711.37 N	105.69 E	68.17	1.07
5246.00	13.17	12.97	5159.48	733.00 N	109.86 E	69.31	1.11
5341.00	12.61	12.70	5252.08	753.66 N	114.57 E	69.70	0.60
5436.00	13.33	10.95	5344.66	774.53 N	118.93 E	70.48	0.86
5531.00	12.94	6.58	5437.18	795.85 N	122.23 E	72.39	1.12
5626.00	13.89	5.94	5529.58	817.75 N	124.63 E	75.32	1.00
5721.00	14.94	7.60	5621.59	841.23 N	127.43 E	78.24	1.19
5816.00	15.44	5.77	5713.28	865.95 N	130.32 E	81.37	0.73
5945.00	14.71	359.77	5837.84	899.41 N	131.98 E	87.79	1.34
6052.00	15.14	348.88	5941.26	926.71 N	129.23 E	97.01	2.65
6097.00	18.66	336.53	5984.32	939.09 N	125.23 E	103.87	11.14
6145.00	22.40	328.62	6029.27	953.95 N	117.40 E	115.04	9.69
6192.00	23.65	328.27	6072.52	969.62 N	107.78 E	128.14	2.66
6240.00	25.98	328.22	6116.09	986.74 N	97.18 E	142.54	4.86
6287.00	27.72	325.67	6158.02	1004.52 N	85.59 E	158.06	4.43
6335.00	30.89	318.19	6199.89	1022.94 N	71.07 E	176.57	10.08
6382.00	33.77	312.53	6239.61	1040.77 N	53.40 E	198.01	8.89
6430.00	36.37	308.69	6278.90	1058.69 N	32.45 E	222.64	7.11
6476.00	38.89	305.32	6315.33	1075.56 N	10.02 E	248.47	7.06
6524.00	41.26	300.02	6352.07	1092.20 N	15.99 W	277.72	8.65
6571.00	43.00	296.07	6386.93	1107.00 N	43.81 W	308.28	6.75
6619.00	44.99	292.98	6421.46	1120.82 N	74.15 W	341.04	6.09
6666.00	47.07	289.51	6454.10	1133.05 N	105.67 W	374.58	6.91
6714.00	49.88	285.90	6485.92	1143.96 N	139.90 W	410.42	8.13
6761.00	53.91	281.34	6514.93	1152.62 N	175.83 W	447.38	11.47
6809.00	58.40	278.22	6541.66	1159.36 N	215.10 W	487.12	10.79

6856.00	61.01	276.62	6565.37	1164.59 N	255.34 W	527.44	6.29
6904.00	64.05	275.99	6587.51	1169.26 N	297.66 W	569.65	6.44
6951.00	69.16	274.82	6606.17	1173.31 N	340.59 W	612.29	11.11
6999.00	73.51	273.86	6621.53	1176.75 N	385.92 W	657.13	9.25
7100.00	80.15	271.39	6644.54	1181.22 N	484.10 W	753.51	6.99
7186.00	84.71	269.82	6655.86	1182.11 N	569.32 W	836.45	5.60
7281.00	87.04	270.34	6662.70	1182.25 N	664.07 W	928.46	2.51
7376.00	90.71	270.82	6664.56	1183.21 N	759.03 W	1020.87	3.89
7471.00	89.26	269.34	6664.59	1183.34 N	854.02 W	1113.12	2.18
7566.00	91.17	270.39	6664.23	1183.12 N	949.02 W	1205.28	2.30
7660.00	89.75	270.01	6663.47	1183.45 N	1043.01 W	1296.61	1.56
7755.00	90.40	270.83	6663.34	1184.14 N	1138.01 W	1388.99	1.10
7850.00	91.35	270.77	6661.89	1185.47 N	1232.99 W	1481.51	1.01
7945.00	90.49	269.86	6660.36	1185.99 N	1327.97 W	1573.84	1.32
8040.00	88.55	268.59	6661.15	1184.70 N	1422.95 W	1665.74	2.44
8135.00	89.32	269.31	6662.91	1182.96 N	1517.92 W	1757.51	1.11
8230.00	89.38	269.79	6663.99	1182.22 N	1612.91 W	1849.55	0.51
8324.00	90.96	271.61	6663.71	1183.37 N	1706.89 W	1941.06	2.56
8419.00	86.30	267.31	6665.98	1182.47 N	1801.81 W	2032.99	6.67
8514.00	86.51	268.05	6671.93	1178.63 N	1896.55 W	2124.03	0.81
8609.00	88.09	268.36	6676.41	1175.66 N	1991.39 W	2215.39	1.69
8704.00	91.94	271.00	6676.38	1175.13 N	2086.37 W	2307.46	4.91
8799.00	92.90	271.50	6672.37	1177.20 N	2181.26 W	2400.07	1.14
8894.00	90.83	271.12	6669.28	1179.37 N	2276.18 W	2492.73	2.21
8989.00	89.63	269.21	6668.90	1179.64 N	2371.17 W	2585.02	2.38
9084.00	89.38	269.25	6669.72	1178.37 N	2466.16 W	2676.92	0.26
9178.00	89.41	268.78	6670.70	1176.75 N	2560.14 W	2767.77	0.50
9273.00	89.91	268.40	6671.26	1174.42 N	2655.11 W	2859.40	0.66
9368.00	89.88	268.73	6671.44	1172.04 N	2750.08 W	2951.02	0.35
9463.00	90.71	268.58	6670.96	1169.81 N	2845.05 W	3042.68	0.89
9558.00	91.51	267.30	6669.12	1166.40 N	2939.97 W	3134.00	1.59
9653.00	91.23	266.29	6666.84	1161.09 N	3034.79 W	3224.78	1.10
9748.00	91.30	267.01	6664.75	1155.53 N	3129.60 W	3315.48	0.76
9843.00	92.47	267.88	6661.63	1151.30 N	3224.45 W	3406.55	1.54
9938.00	92.25	268.30	6657.72	1148.14 N	3319.32 W	3497.88	0.49
10033.00	91.08	268.81	6654.96	1145.74 N	3414.25 W	3589.46	1.34
10128.00	89.75	267.89	6654.27	1143.00 N	3509.20 W	3680.98	1.70
10223.00	88.70	268.79	6655.55	1140.25 N	3604.15 W	3772.49	1.46
10318.00	87.70	269.73	6658.54	1139.03 N	3699.10 W	3864.36	1.45
10412.00	87.35	269.94	6662.60	1138.76 N	3793.01 W	3955.46	0.43
10507.00	88.46	270.32	6666.08	1138.97 N	3887.94 W	4047.67	1.23
10602.00	89.97	270.46	6667.38	1139.61 N	3982.93 W	4140.04	1.60
10697.00	90.06	270.13	6667.36	1140.11 N	4077.93 W	4232.37	0.36
10792.00	91.36	269.15	6666.18	1139.51 N	4172.91 W	4324.44	1.71
10887.00	92.65	269.05	6662.86	1138.03 N	4267.84 W	4416.24	1.37
10982.00	90.46	269.16	6660.27	1136.54 N	4362.79 W	4508.05	2.31
11145.00	91.63	269.53	6657.29	1134.68 N	4525.75 W	4665.80	0.75
11208.00	91.63	269.53	6655.50	1134.16 N	4588.72 W	4726.81	0.01

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 CLOSURE OF 283.88 DEGREES (GRID)
A TOTAL CORRECTION OF 7.83 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11208.00 FEET
IS 4726.81 FEET ALONG 283.88 DEGREES (GRID)**