

PCGK : Pressure Case Gamma
PCDC: Pressure Case Directional

1 : 600 / 1 : 240

Country : USA			
Field : Wattenberg			
Location : Lat: 40°25' 54.66" North Long: 104°29' 22.06" West			
Well : SLW Ranch B01-66-1HN			
Company : Noble Energy			
Rig : H&P 315			
LOCATION			
Latitude : 40°25' 54.66" North Longitude : 104°29' 22.06" West			
UTM Easting = 3,281,307.230 ft UTM Northing = 1,401,766.194 ft			
Other Services Directional Drilling			
Company : Noble Energy			
Rig : H&P 315			
Well : SLW Ranch B01-66-1HN			
Field : Wattenberg			
Country : USA			
API Number : 0512336318			
Permanent Datum : Ground Level			
Elevation : 4612.00 ft			
Log Measured From : Drill Floor			
24.00 ft Above Permanent Datum			
Drilling Measured From : Drill Floor			
MD LOG			
Elev. KB N/A			
DF 4636.00 ft			
GL 4612.00 ft			
WD N/A			
Depth Logged : 663.00 ft To 11,201.00 ft			
Date Logged : 14-Jan-13 To 20-Jan-13			
Total Depth MD : 11,201.00 ft TVD : 6,681.44 ft			
Spud Date : 14-Jan-13			
Unit No. : 11610113			
Job No. : CA-XX-0900135795			
Plot Type : Final			
Plot Date : 21-Jan-13			
Run No.			
Size			
From			
To			
8.750 in			
663.00 ft			
5,978.00 ft			
8.750 in			
5,978.00 ft			
7,109.00 ft			
6.125 in			
7,109.00 ft			
11,201.00 ft			
Run No.			
Size			
From			
To			
7.000 in			
26.00 lbpf			
SURFACE			
7,099.00 ft			

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	17-Jan-13	18-Jan-13	21-Jan-13		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	663.00	5,978.00	7,109.00		
Log End Depth (MD, ft)	5,978.00	7,109.00	11,201.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	15-Jan-13 22:00	17-Jan-13 06:05	18-Jan-13 01:45		
Drill/Wipe End Date and Time	16-Jan-13 22:00	17-Jan-13 20:45	20-Jan-13 14:40		
Min Inc (deg) @ Depth (MD, ft)	.09 @ 993.00	14.77 @ 6,015.00	87.16 @ 7,143.00		
Max Inc (deg) @ Depth (MD, ft)	13.77 @ 5,068.00	85.70 @ 7,109.00	91.60 @ 9,515.00		
Bit TFA(in2) / Bit Type	.75 / PDC	.75 / PDC	.86 / PDC		
Flow Rate (gpm)	593.91	571.00	269.67		
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)	8.70 / 28.00	10.00 / 35.00	9.50 / 31.00		
Filtrate CL (ppm)	1,300.00	1,300.00	1,400.00		
pH / Fluid Loss (mptm)	9.30 / 0	9.20 / 7	9.20 / 9		
PV (cP) / YP (Ihf2)	2 / 4.00	9 / 9.00	6 / 7.00		
% Solids / % Sand	4.5 / 0.20	10.5 / 0.20	4.7 / 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 (degF) / Source	154.30 / PCM	175.21 / PCM	234.12 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Henry Schmeidler	Henry Schmeidler	Henry Schmeidler		
Customer Representative	Dave Nielsen	Martin Suarez	Martin Suarez		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11341343	11341343	11672158		
Insert Serial Number	10997267	10997267	11055831		
Date and Time Initialized	15-Jan-13 03:25	15-Jan-13 03:25	18-Jan-13 17:03		
Date and Time Read	18-Jan-13 02:10	18-Jan-13 02:21	21-Jan-13 01:48		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	54.53	52.49	61.40		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11341343	11341343	11672158		
Sonde Serial Number	11478073	11478073	10993516		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	319.30	225.07	58.32		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.43	47.39	56.32		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11341343	11341343	11672158		
Insert/Sonde Serial Number	11293287	11293287	11293277		

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 7061 ft MD. Gamma cannot be measured accurately within cased hole, and collection resumes after drilling through cement at 7110 ft MD.

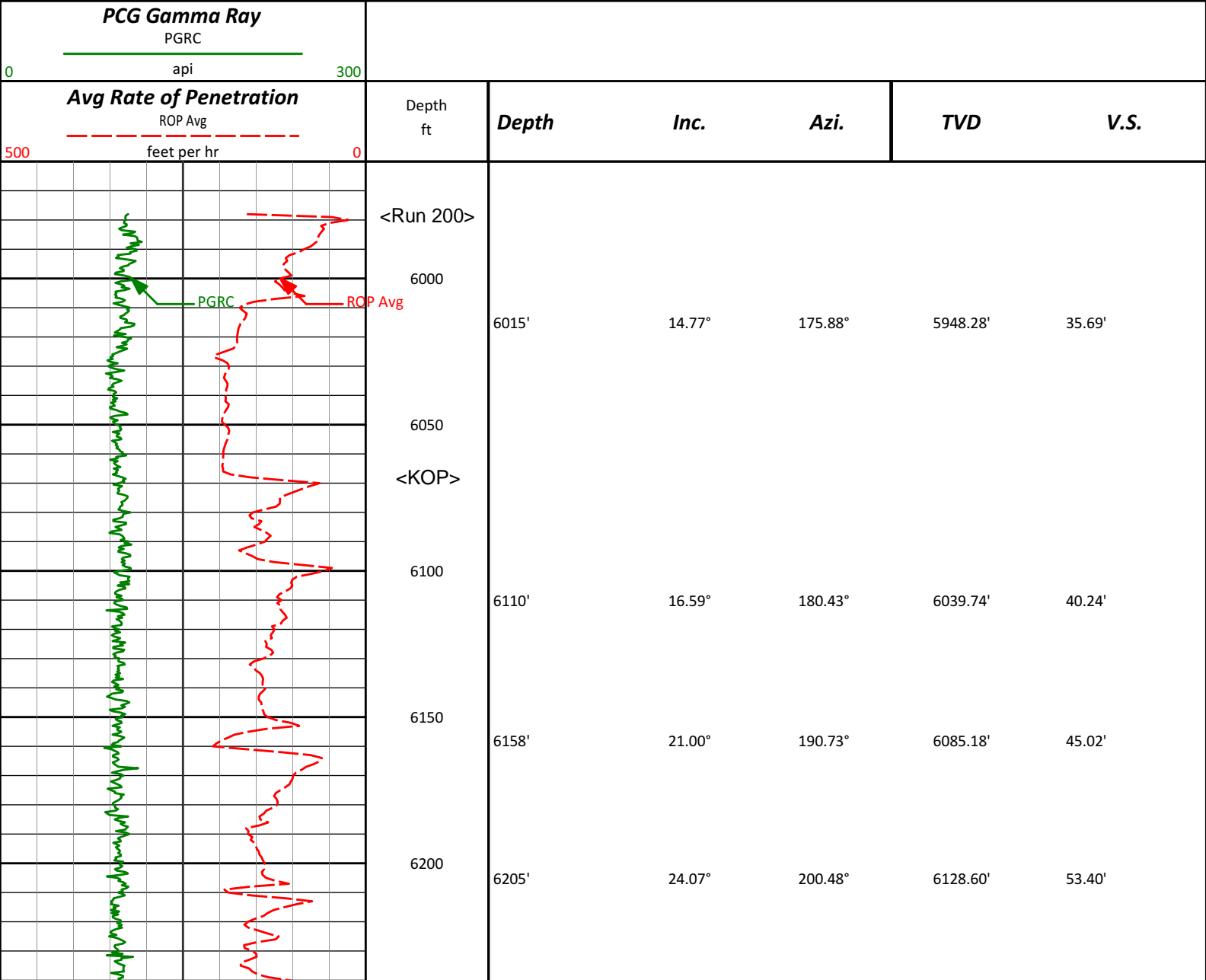
WARRANTY

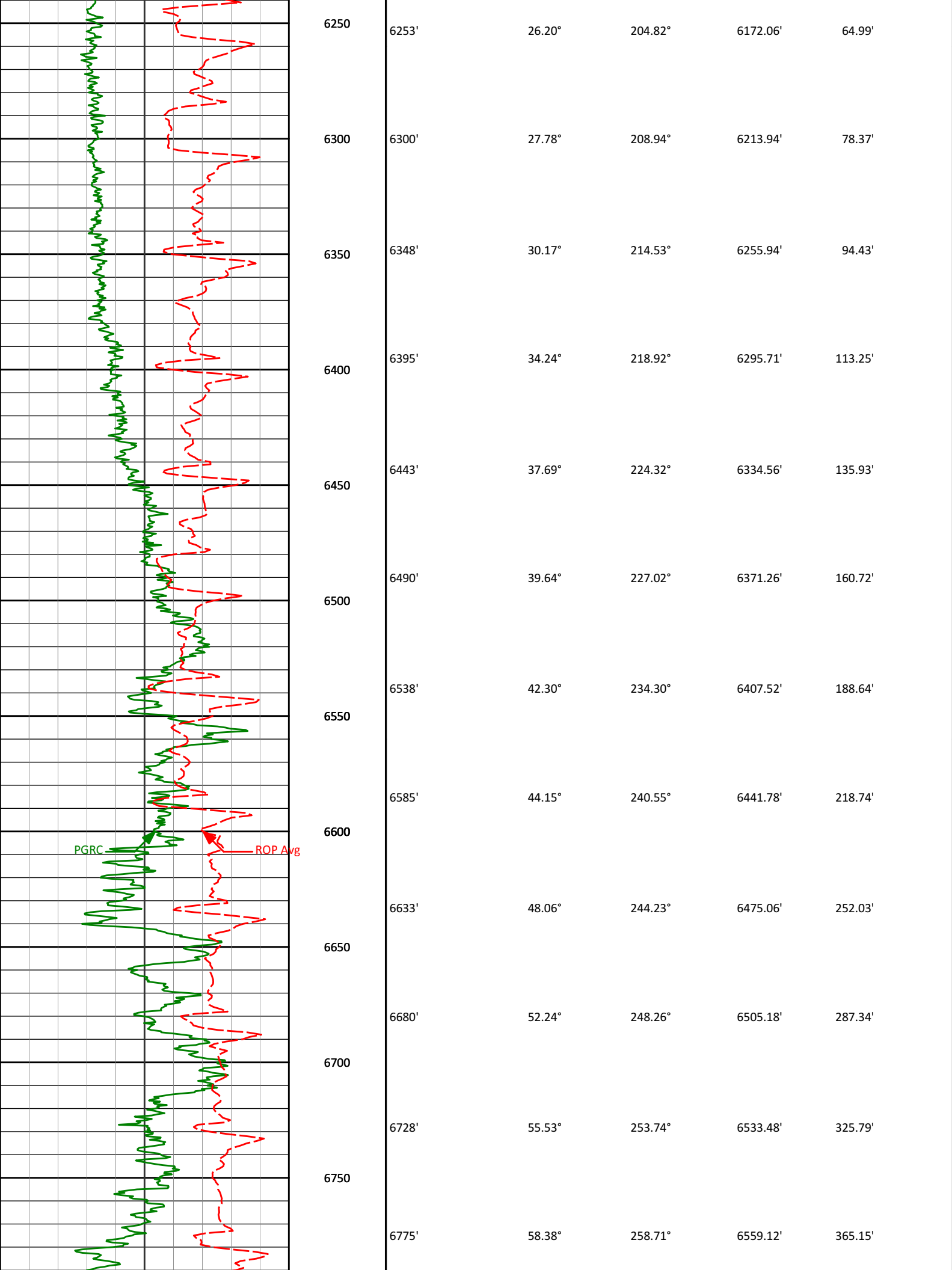
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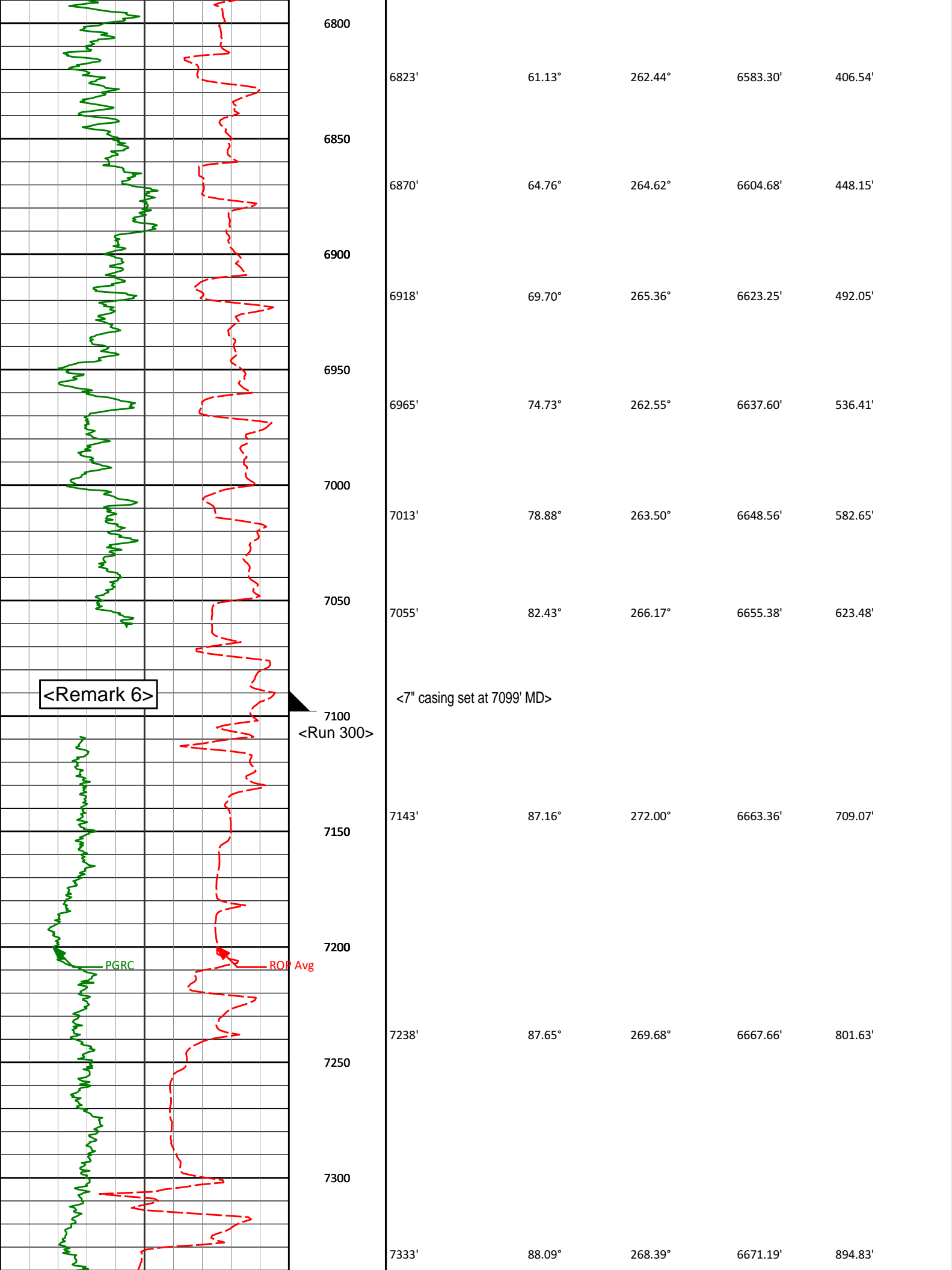
HALLIBURTON
Sperry Drilling Services

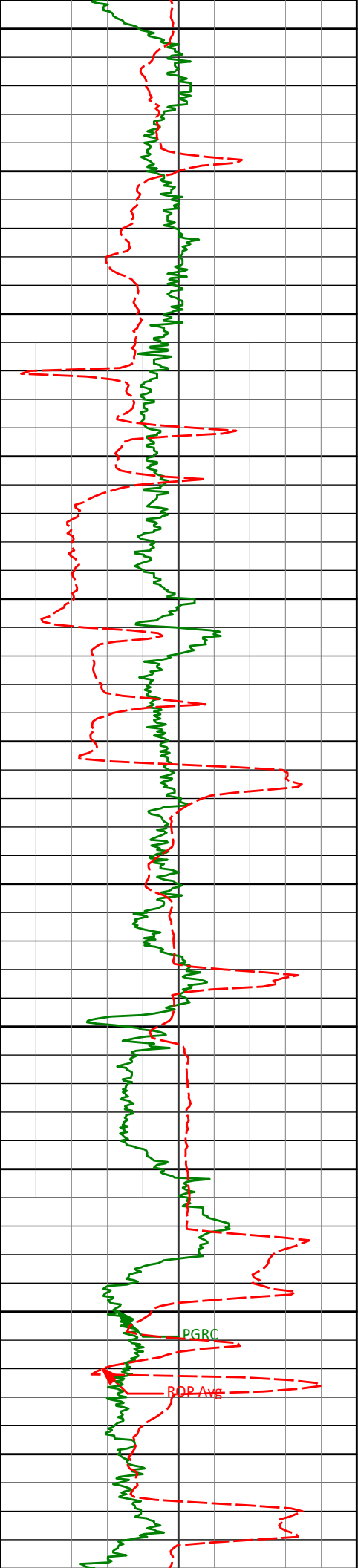
MD Main Log 1:600

Noble Energy, Inc
SLW Ranch B01-66-1HN
H&P 315
T5N R64W









7350

7400

7450

7500

7550

7600

7650

7700

7750

7800

7850

7428'

88.30°

267.87°

6674.18'

988.32'

7522'

89.30°

267.75°

6676.16'

1080.95'

7617'

89.94°

267.38°

6676.79'

1174.65'

7712'

90.95°

267.19°

6676.04'

1268.42'

7807'

89.54°

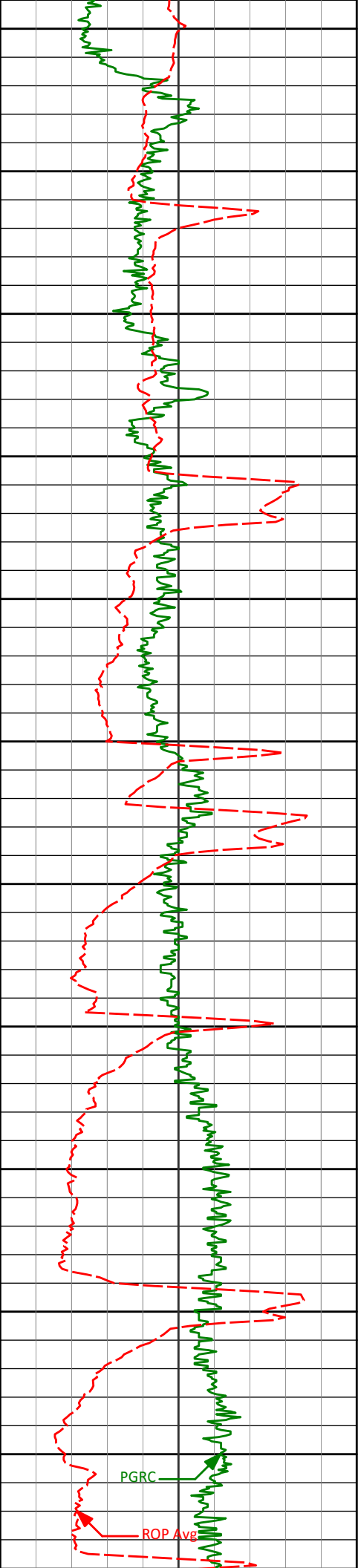
267.49°

6675.63'

1362.18'

PGRC

BOP AVE



7900

7950

8000

8050

8100

8150

8200

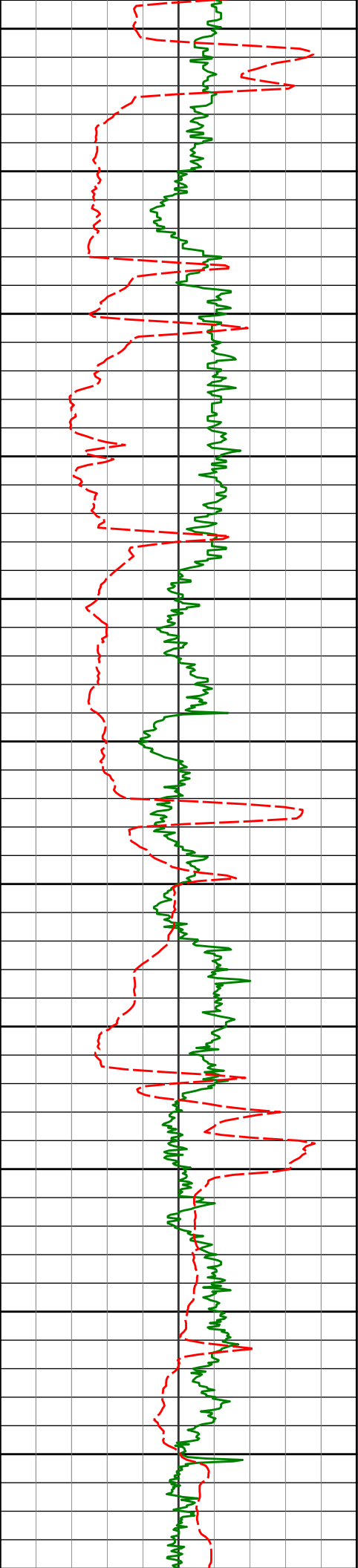
8250

8300

8350

8400

7902'	89.04°	267.23°	6676.80'	1455.93'
7997'	90.03°	267.26°	6677.57'	1549.71'
8092'	88.60°	266.61°	6678.71'	1643.57'
8187'	88.65°	268.01°	6680.99'	1737.31'
8282'	88.68°	267.49°	6683.21'	1830.93'
8377'	88.43°	268.42°	6685.60'	1924.50'



8450

8471'

89.53°

268.49°

6687.27'

2016.94'

8500

8550

8566'

90.20°

269.17°

6687.49'

2110.28'

8600

8650

8661'

89.92°

269.11°

6687.39'

2203.51'

8700

8750

8756'

90.00°

268.86°

6687.45'

2296.79'

8800

8850

8851'

90.71°

269.08°

6686.86'

2390.08'

8900

8950

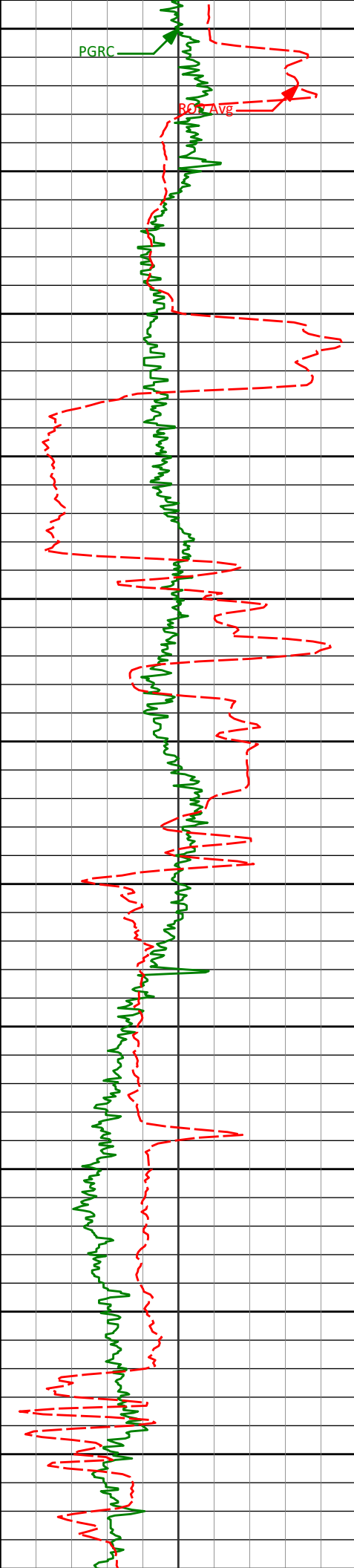
8946'

91.16°

268.91°

6685.31'

2483.35'



9000

9050

9100

9150

9200

9250

9300

9350

9400

9450

9500

9041'

90.81°

269.20°

6683.68'

2576.60'

9135'

90.50°

270.26°

6682.60'

2668.66'

9230'

90.85°

270.37°

6681.48'

2761.49'

9325'

90.31°

270.13°

6680.52'

2854.35'

9420'

90.90°

270.23°

6679.52'

2947.23'

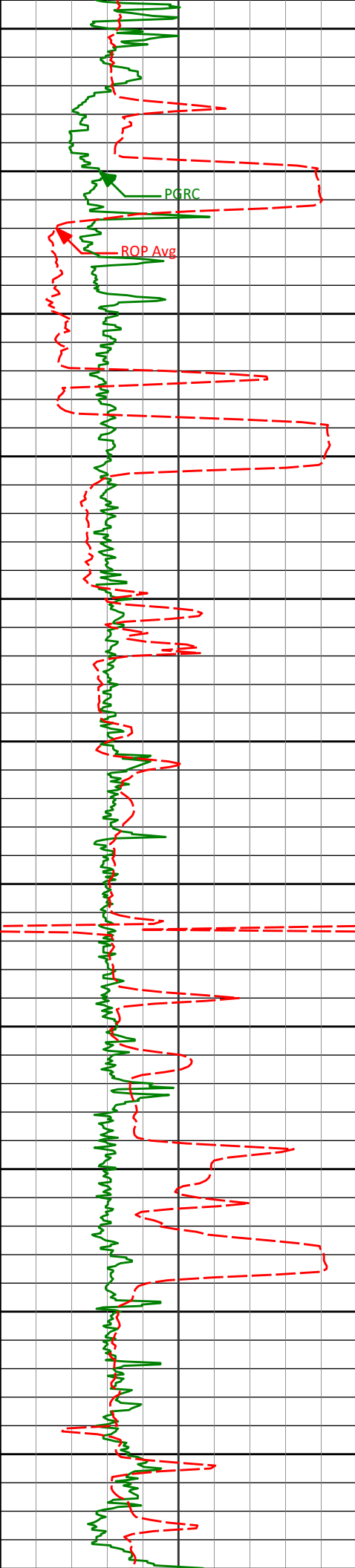
9515'

91.60°

270.10°

6677.45'

3040.11'



9550

9600

9650

9700

9750

9800

9850

9900

9950

10000

10050

9610'

90.69°

269.95°

6675.55'

3133.03'

9705'

89.82°

268.99°

6675.13'

3226.16'

9800'

88.78°

268.41°

6676.29'

3319.52'

9895'

90.56°

269.63°

6676.83'

3412.79'

9990'

88.81°

269.02°

6677.36'

3505.96'

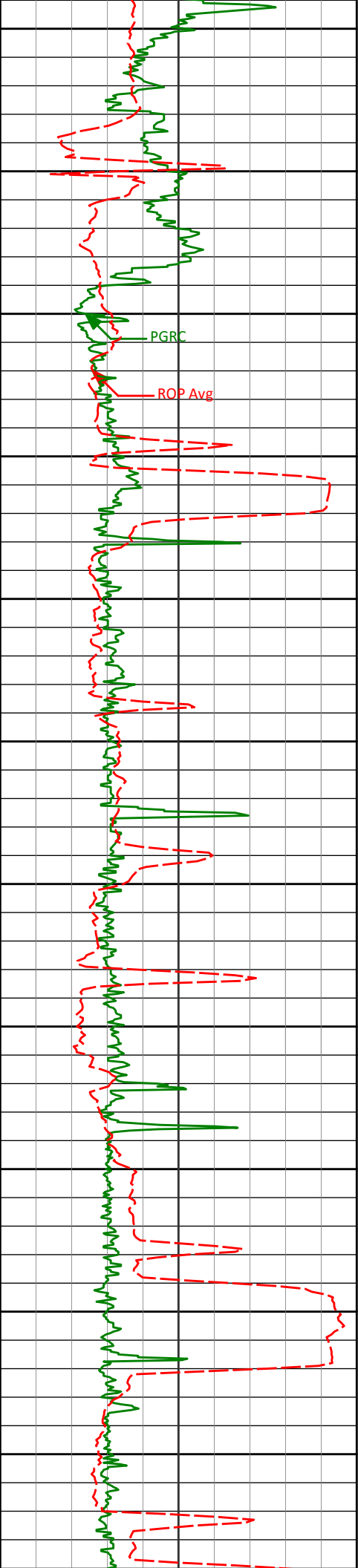
10085'

89.50°

269.45°

6678.76'

3599.15'



10100

10150

10200

10250

10300

10350

10400

10450

10500

10550

10600

10179'

90.13°

268.98°

6679.06'

3691.38'

10274'

89.15°

268.77°

6679.66'

3784.70'

10369'

89.17°

267.28°

6681.05'

3878.26'

10464'

90.31°

266.21°

6681.48'

3972.17'

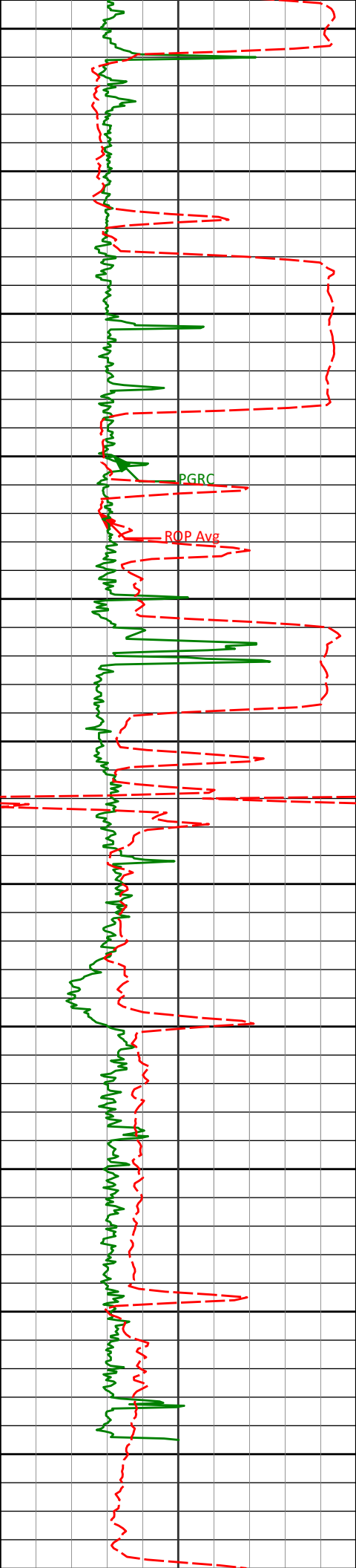
10559'

89.82°

266.01°

6681.37'

4066.24'



10650

10700

10750

10800

10850

10900

10950

11000

11050

11100

11150

10654'

10749'

10844'

10939'

11033'

11138'

89.91°

89.40°

90.54°

90.91°

89.49°

89.85°

265.96°

266.60°

267.64°

269.65°

268.39°

266.94°

6681.60'

6682.16'

6682.21'

6681.00'

6680.67'

6681.28'

4160.33'

4254.36'

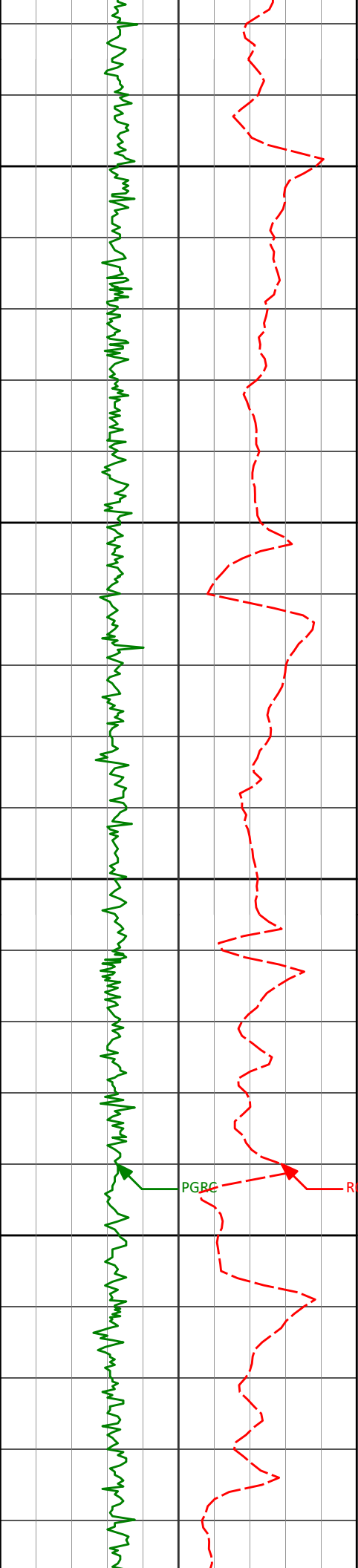
4348.18'

4441.55'

4533.84'

4637.37'

<div><TD @ 11,201' MD></div>		11200					
<div><div>Avg Rate of Penetration</div><div>ROP Avg</div><div>5000 feet per hr0</div></div>		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
<div><div>PCG Gamma Ray</div><div>PGRC</div><div>0api300</div></div>							
<div><div>HALLIBURTON</div><div>Sperry Drilling Services</div><div>MD Detail Log 1:240</div><div>Noble Energy, Inc SLW Ranch B01-66-1HN H&P 315 T5N R64W</div></div>							
<div><div>PCG Gamma Ray</div><div>PGRC</div><div>0api300</div></div>							
<div><div>Avg Rate of Penetration</div><div>ROP Avg</div><div>5000 feet per hr0</div></div>		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
<div><div><Run 200></div><div>6000</div><div>6015'</div><div>6050</div><div><KOP></div></div>							



6100

6110'

16.59°

180.43°

6039.74'

40.24'

6150

6158'

21.00°

190.73°

6085.18'

45.02'

6200

6205'

24.07°

200.48°

6128.60'

53.40'

6250

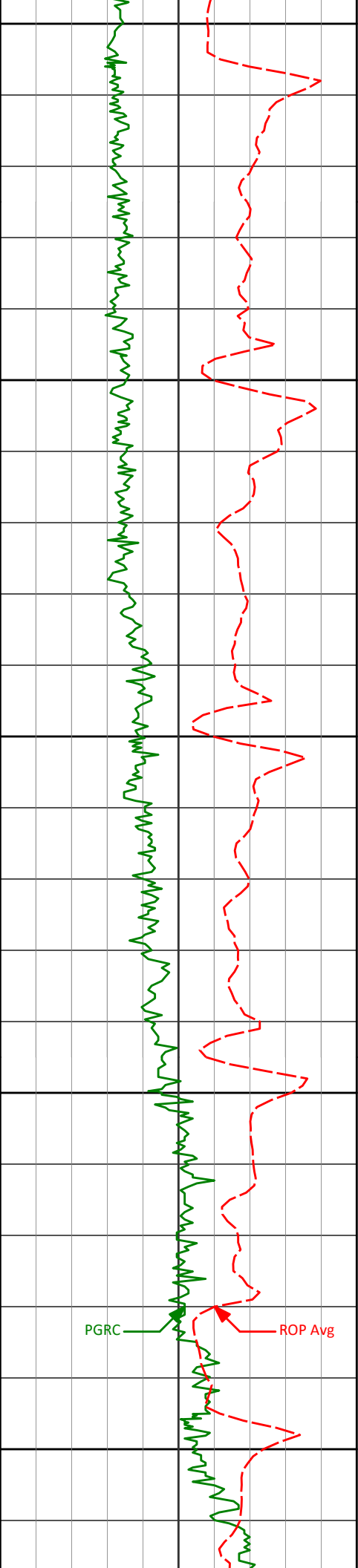
6253'

26.20°

204.82°

6172.06'

64.99'



6300

6300'

27.78°

208.94°

6213.94'

78.37'

6350

6348'

30.17°

214.53°

6255.94'

94.43'

6400

6395'

34.24°

218.92°

6295.71'

113.25'

6450

6443'

37.69°

224.32°

6334.56'

135.93'

6500

6490'

39.64°

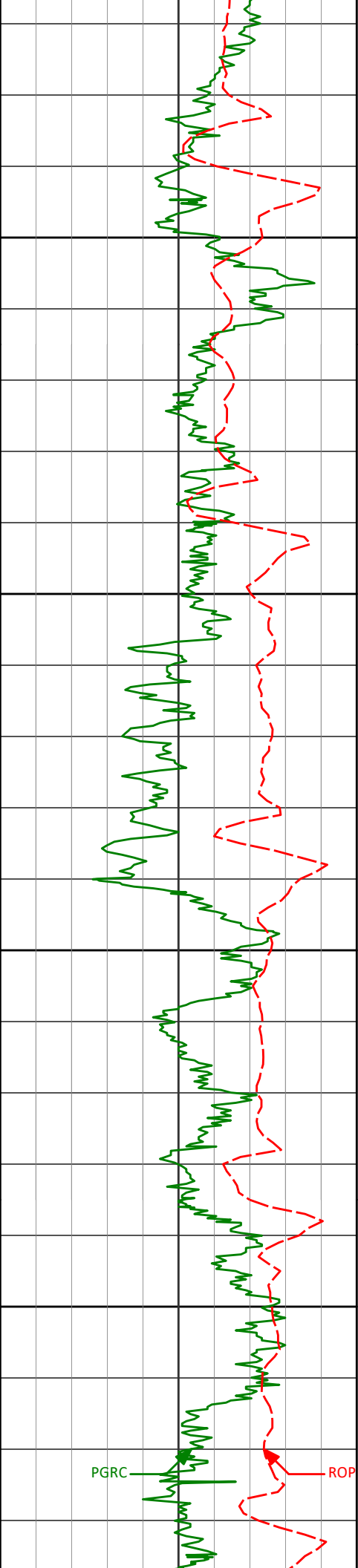
227.02°

6371.26'

160.72'

PGRC

ROP Avg



6550

6600

6650

6700

6538'

42.30°

234.30°

6407.52'

188.64'

6585'

44.15°

240.55°

6441.78'

218.74'

6633'

48.06°

244.23°

6475.06'

252.03'

6680'

52.24°

248.26°

6505.18'

287.34'

6728'

55.53°

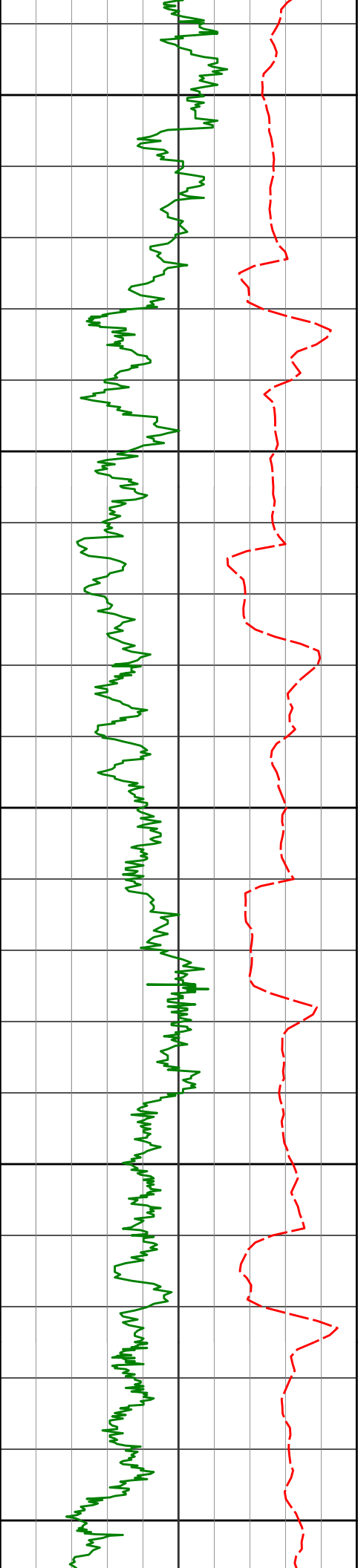
253.74°

6533.48'

325.79'

PGRC

ROP Avg



6750

6775'

58.38°

258.71°

6559.12'

365.15'

6800

6823'

61.13°

262.44°

6583.30'

406.54'

6850

6870'

64.76°

264.62°

6604.68'

448.15'

6900

6918'

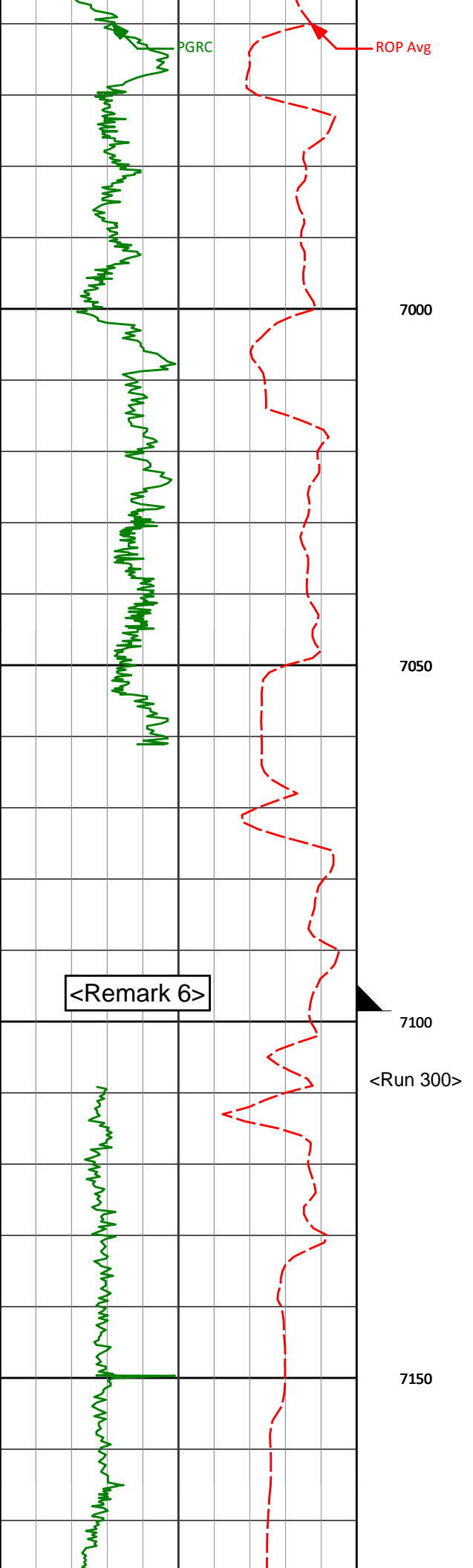
69.70°

265.36°

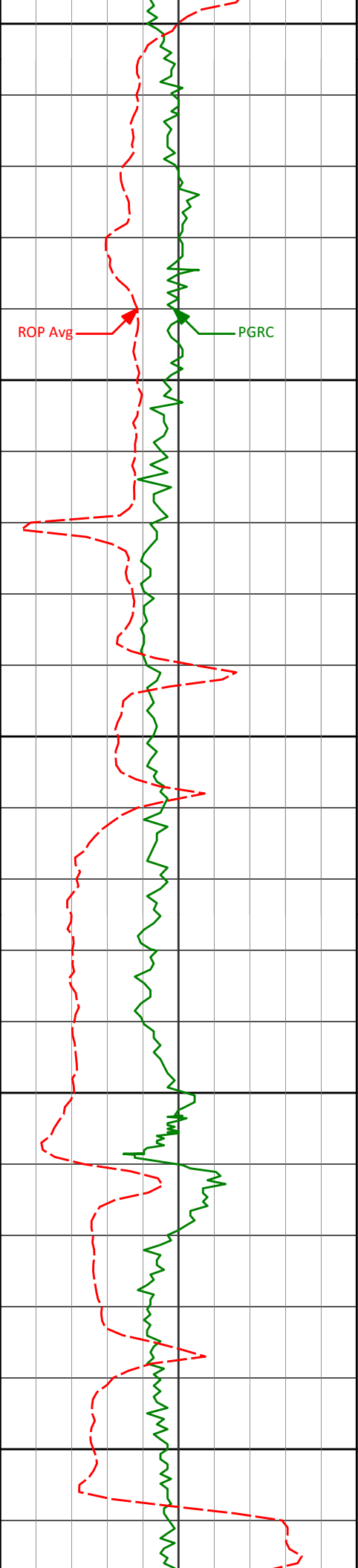
6623.25'

492.05'

6950



6965'	74.73°	262.55°	6637.60'	536.41'
7013'	78.88°	263.50°	6648.56'	582.65'
7055'	82.43°	266.17°	6655.38'	623.48'
<7" casing set at 7099' MD>				
7143'	87.16°	272.00°	6663.36'	709.07'



7400

7428'

88.30°

267.87°

6674.18'

988.32'

7450

7500

7522'

89.30°

267.75°

6676.16'

1080.95'

7550

7600

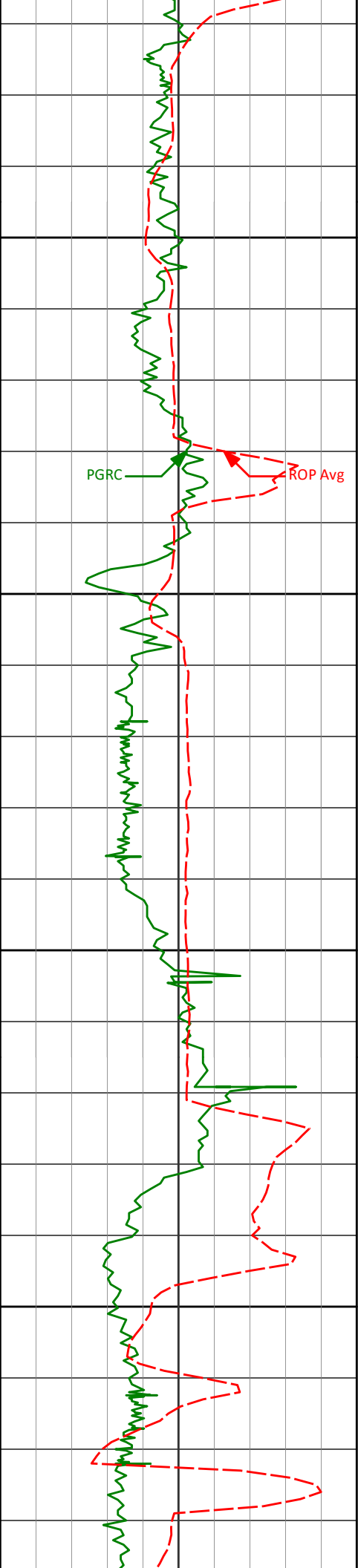
7617'

88.34°

267.88°

6676.78'

1174.65'



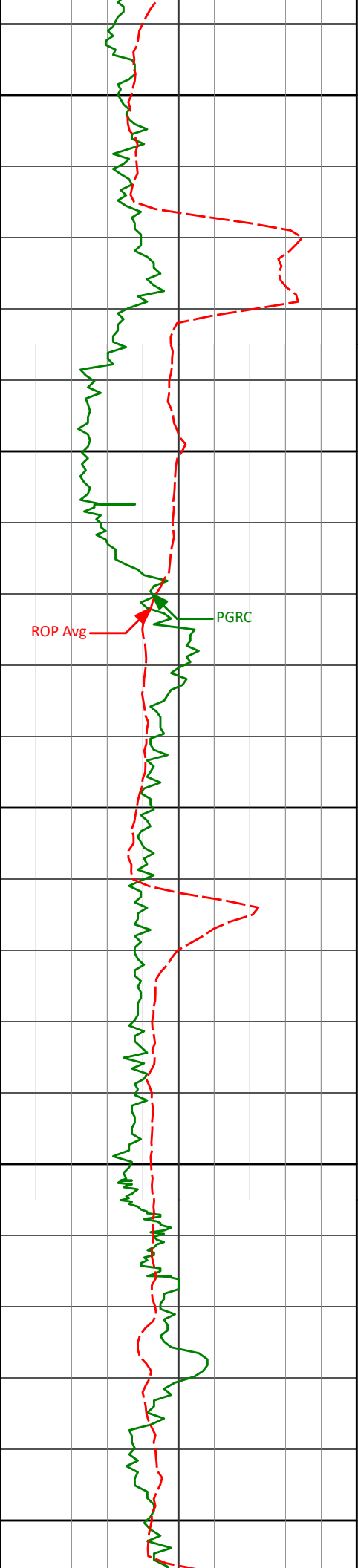
7650

7700

7750

7800

7617'	89.94°	267.38°	6676.79'	1174.65'
7712'	90.95°	267.19°	6676.04'	1268.42'
7807'	89.54°	267.49°	6675.63'	1362.18'



7850

7900

7950

8000

8050

7902'

89.04°

267.23°

6676.80'

1455.93'

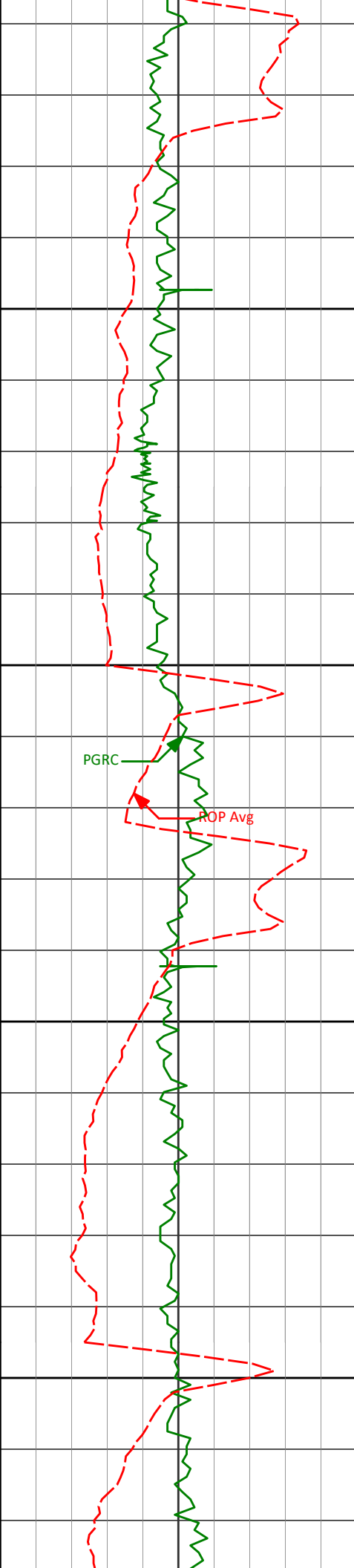
7997'

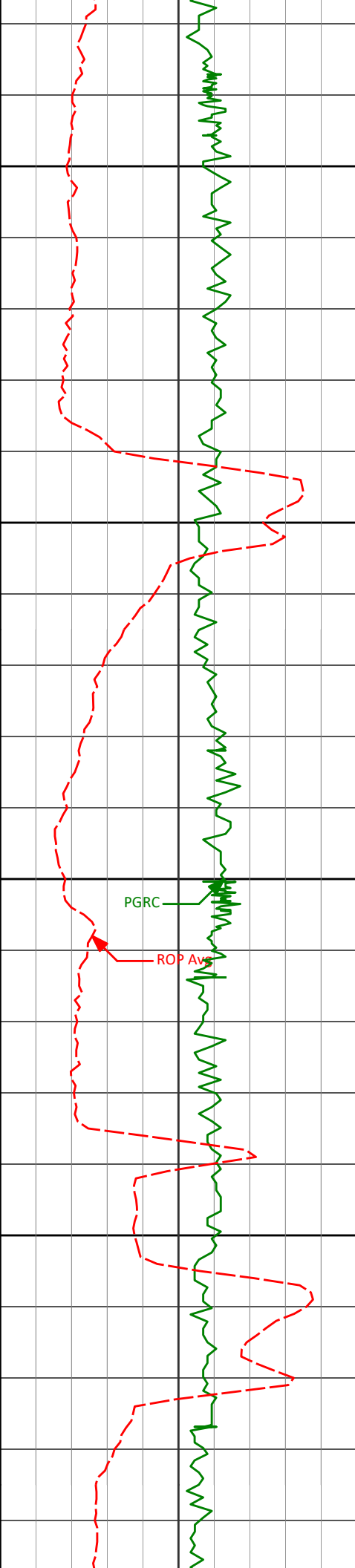
90.03°

267.26°

6677.57'

1549.71'





8300

8350

8400

8450

8282'

88.68°

267.49°

6683.21'

1830.93'

8377'

88.43°

268.42°

6685.60'

1924.50'

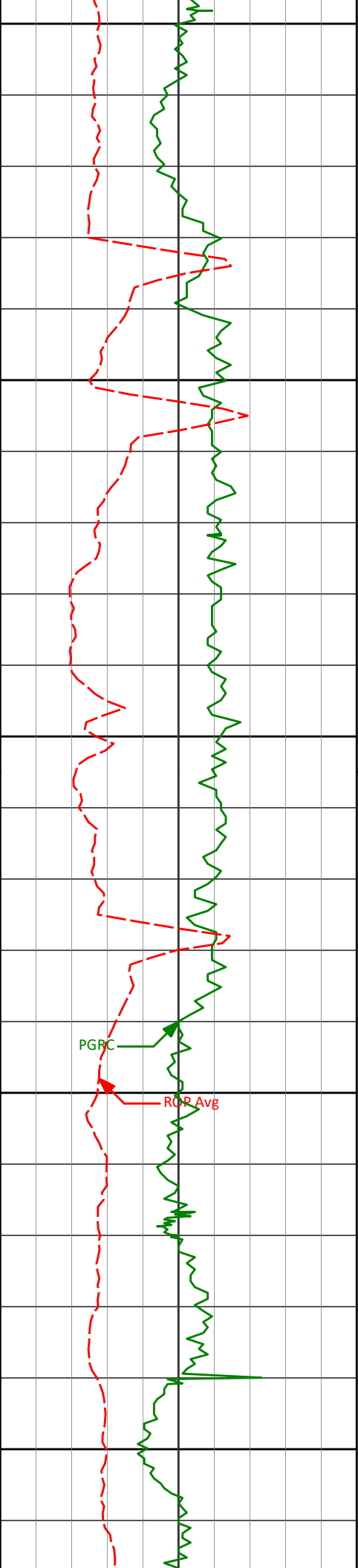
8471'

89.53°

268.49°

6687.27'

2016.94'



8500

8550

8600

8650

8700

8566'

90.20°

269.17°

6687.49'

2110.28'

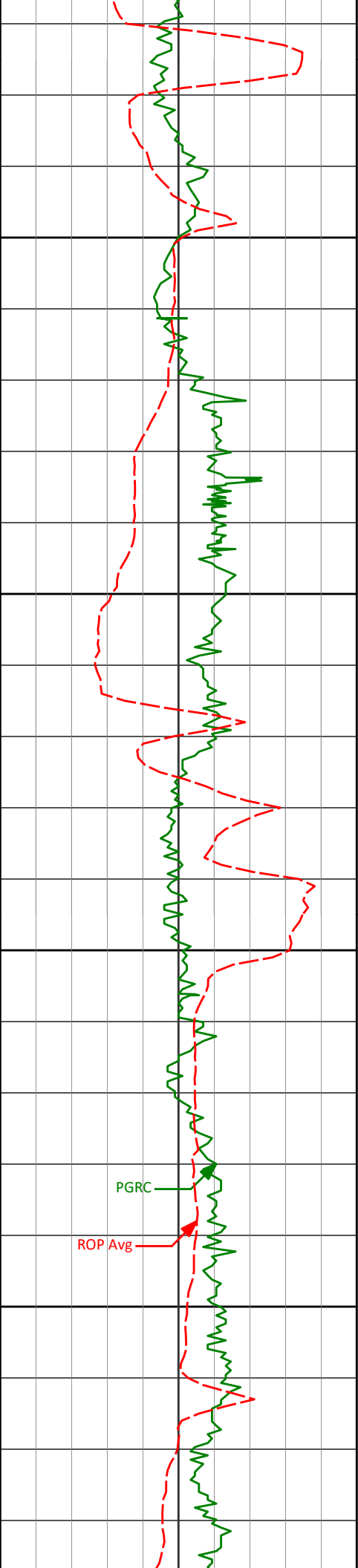
8661'

89.92°

269.11°

6687.39'

2203.51'



8750

8756'

90.00°

268.86°

6687.45'

2296.79'

8800

8850

8851'

90.71°

269.08°

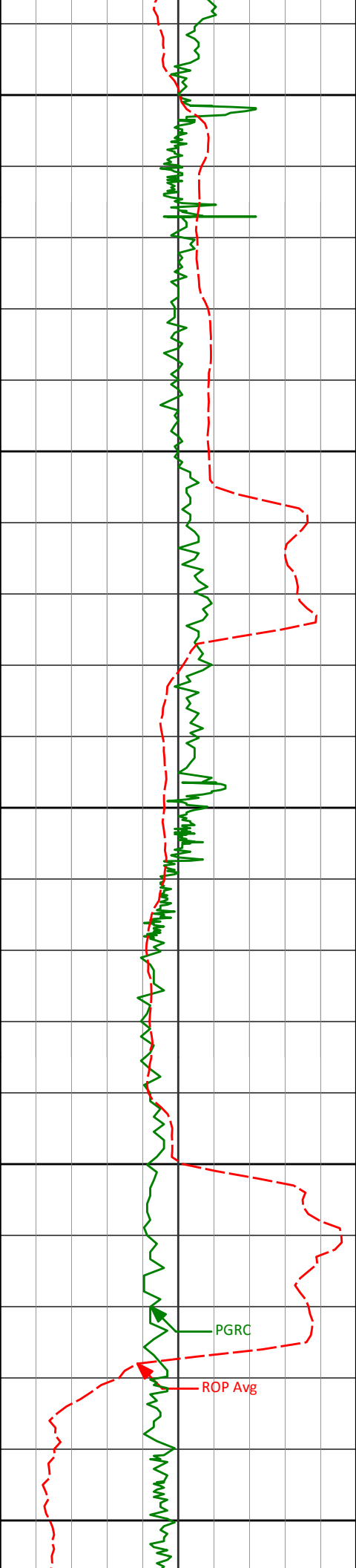
6686.86'

2390.08'

8900

PGRC

ROP Avg



8950

9000

9050

9100

9150

8946'

91.16°

268.91°

6685.31'

2483.35'

9041'

90.81°

269.20°

6683.68'

2576.60'

9135'

90.50°

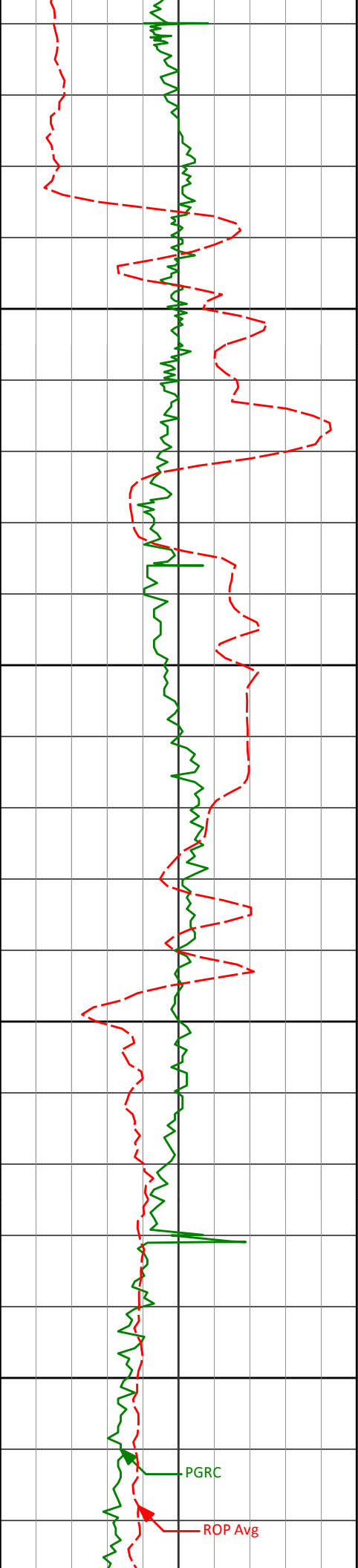
270.26°

6682.60'

2668.66'

PGRC

ROP Avg



9200

9250

9300

9350

9230'

90.85°

270.37°

6681.48'

2761.49'

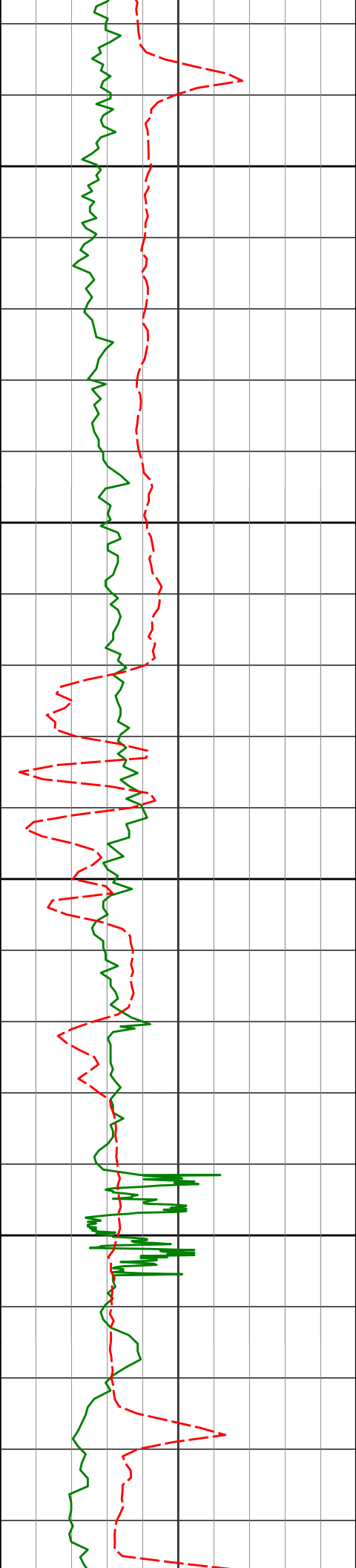
9325'

90.31°

270.13°

6680.52'

2854.35'



9400

9420'

90.90°

270.23°

6679.52'

2947.23'

9450

9500

9515'

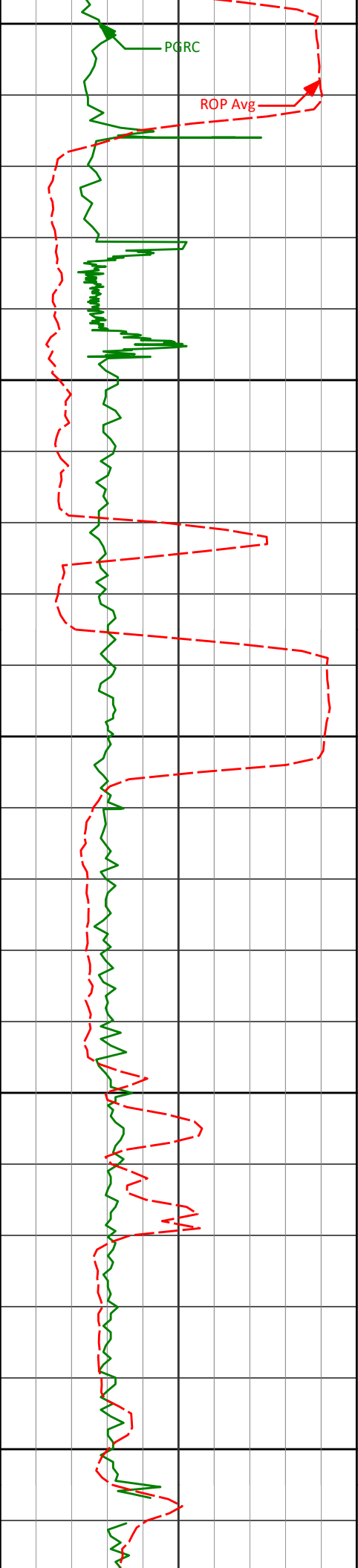
91.60°

270.10°

6677.45'

3040.11'

9550



9600

9610'

90.69°

269.95°

6675.55'

3133.03'

9650

9700

9705'

89.82°

268.99°

6675.13'

3226.16'

9750

9800

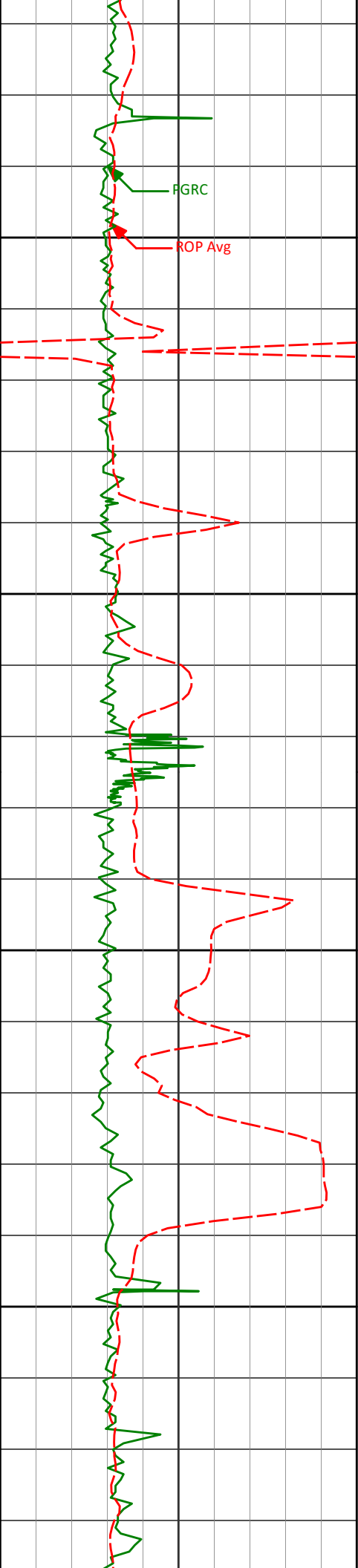
9800'

88.78°

268.41°

6676.29'

3319.52'



9850

9900

9950

10000

9895'

90.56°

269.63°

6676.83'

3412.79'

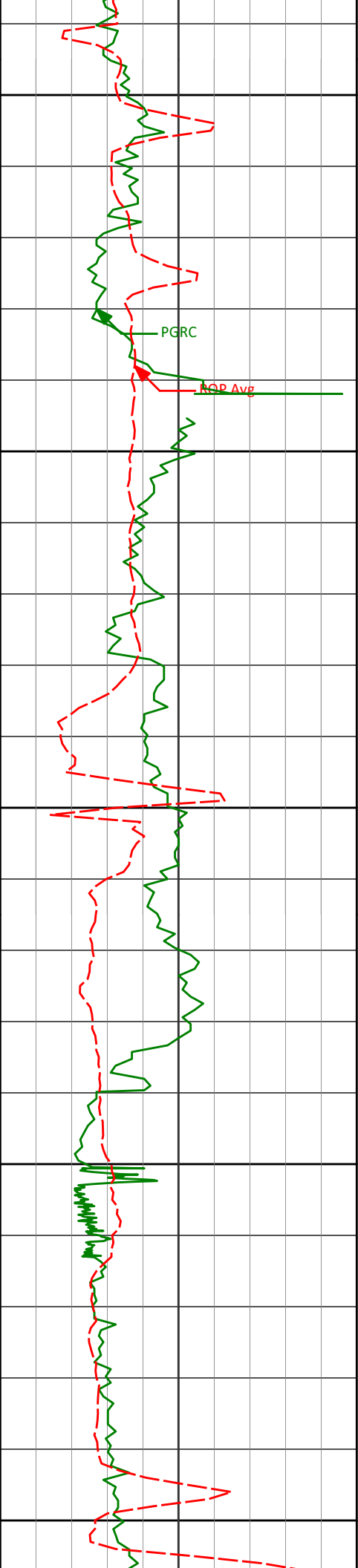
9990'

88.81°

269.02°

6677.36'

3505.96'



10050

10100

10150

10200

10250

10085'

89.50°

269.45°

6678.76'

3599.15'

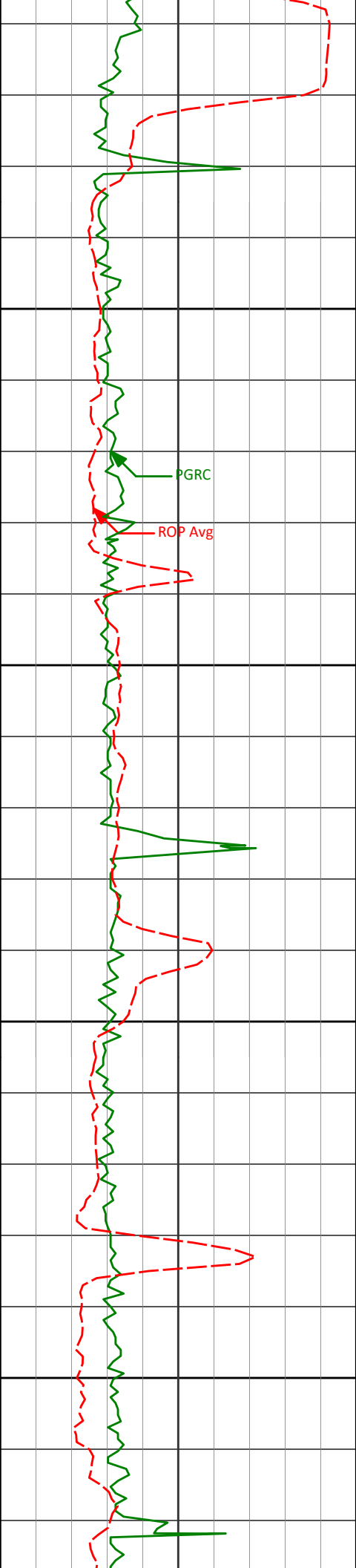
10179'

90.13°

268.98°

6679.06'

3691.38'



10300

10350

10400

10450

10274'

89.15°

268.77°

6679.66'

3784.70'

10369'

89.17°

267.28°

6681.05'

3878.26'

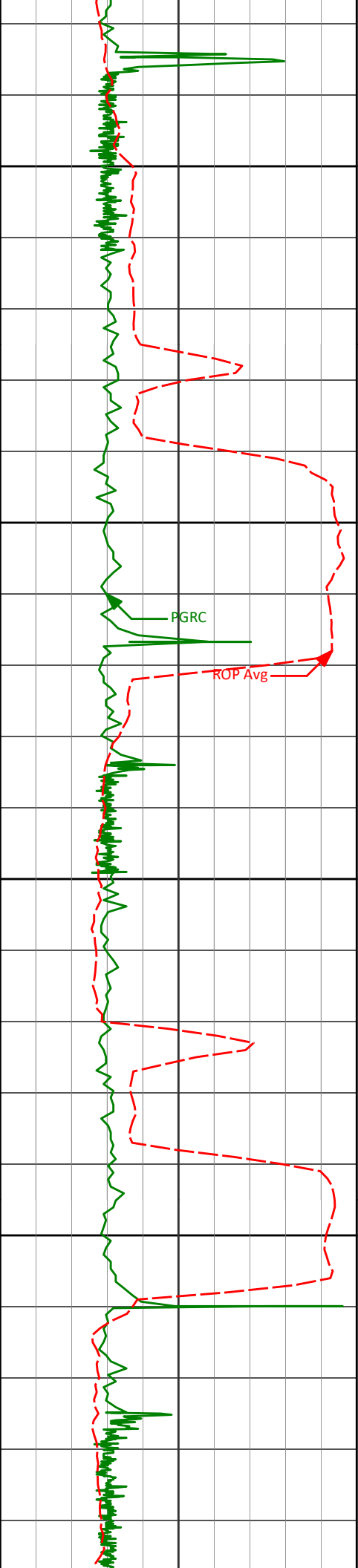
10464'

90.31°

266.21°

6681.48'

3972.17'



10500

10550

10600

10650

10559'

89.82°

266.01°

6681.37'

4066.24'

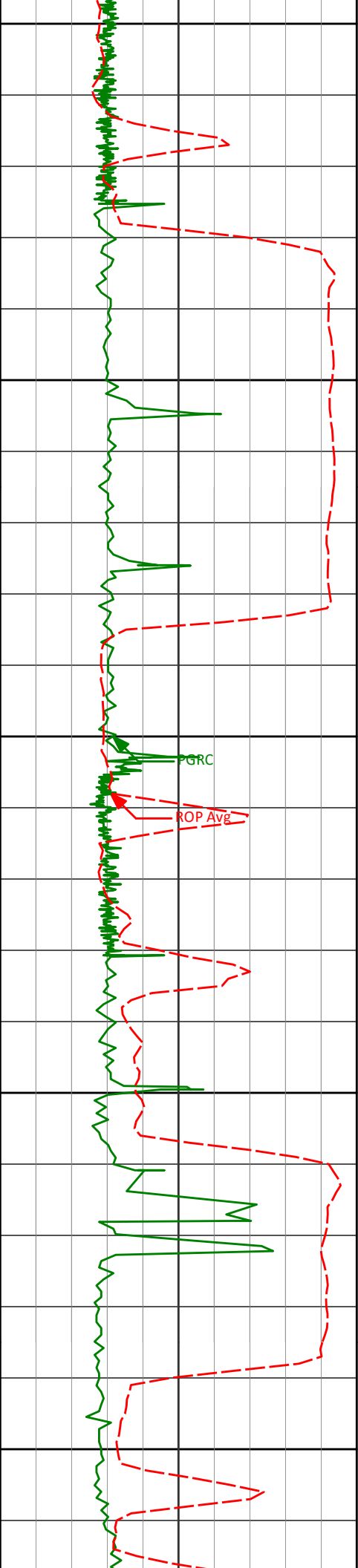
10654'

89.91°

265.96°

6681.60'

4160.33'



10700

10750

10800

10850

10900

10749'

89.40°

266.60°

6682.16'

4254.36'

10844'

90.54°

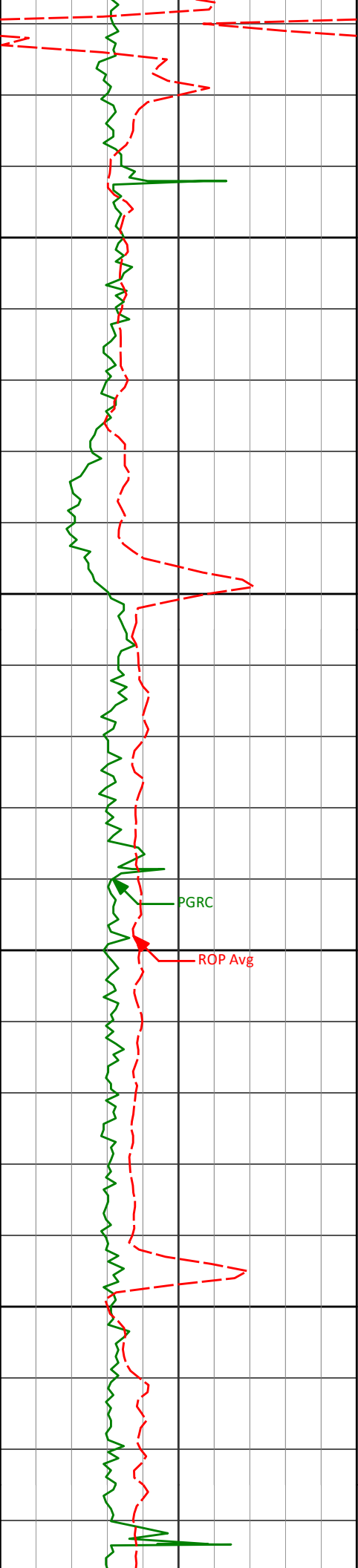
267.64°

6682.21'

4348.18'

GRC

ROP Avg



10950

11000

11050

11100

10939'

90.91°

269.65°

6681.00'

4441.55'

11033'

89.49°

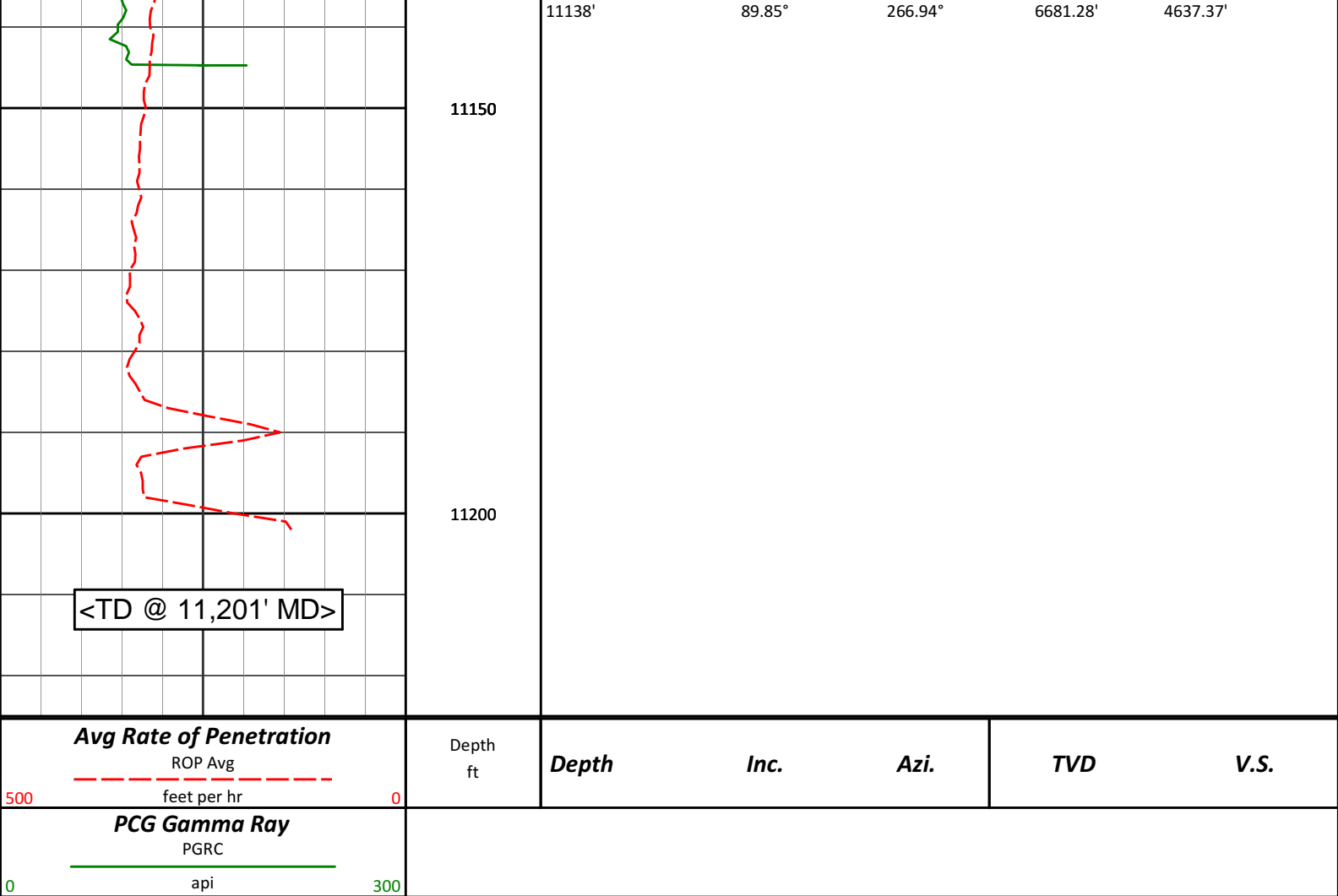
268.39°

6680.67'

4533.84'

PGRC

ROP Avg



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
SLW Ranch B01-66-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0900135795

Survey depth 653 ft created to tie surveys onto bottom of the surface casing shoe.

Last survey is a projection from 11138 ft MD to TD at 11201 ft MD.

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
653.00	0.00	0.00	653.00	0.00 N	0.00 E	0.00	TIE-IN
746.00	0.25	282.53	746.00	0.04 N	0.20 W	0.18	0.27
808.00	0.37	321.40	808.00	0.23 N	0.45 W	0.40	0.38
900.00	0.36	298.52	900.00	0.60 N	0.89 W	0.75	0.16
993.00	0.09	187.73	993.00	0.67 N	1.16 W	1.00	0.43
1085.00	0.26	28.26	1085.00	0.78 N	1.07 W	0.89	0.38
1178.00	0.63	37.51	1177.99	1.37 N	0.66 W	0.36	0.40
1271.00	0.36	6.72	1270.99	2.07 N	0.31 W	-0.12	0.40
1363.00	0.86	251.01	1362.99	2.13 N	0.93 W	0.47	1.16
1458.00	0.78	244.92	1457.98	1.62 N	2.19 W	1.81	0.12
1553.00	0.80	245.67	1552.97	1.08 N	3.38 W	3.09	0.02
1648.00	0.48	218.02	1647.96	0.49 N	4.23 W	4.04	0.46
1743.00	0.69	270.32	1742.96	0.18 N	5.05 W	4.91	0.58
1838.00	0.77	352.92	1837.95	0.82 N	5.71 W	5.42	1.02
1933.00	0.48	37.04	1932.95	1.77 N	5.55 W	5.06	0.57

2028.00	0.35	48.93	2027.94	2.27 N	5.09 W	4.51	0.17
2313.00	0.99	5.81	2312.92	5.29 N	4.19 W	3.01	0.27
2598.00	0.51	12.28	2597.90	8.97 N	3.68 W	1.75	0.17
2883.00	0.37	125.87	2882.89	9.66 N	2.66 W	0.61	0.26
2978.00	1.23	159.37	2977.89	8.52 N	2.06 W	0.25	0.99
3073.00	3.23	180.48	3072.81	4.89 N	1.72 W	0.67	2.24
3168.00	5.56	176.96	3167.52	2.38 S	1.50 W	1.96	2.47
3263.00	7.16	179.75	3261.94	12.90 S	1.23 W	3.87	1.71
3358.00	8.73	172.66	3356.02	25.96 S	0.28 W	5.64	1.94
3453.00	9.12	169.89	3449.88	40.52 S	1.96 E	6.45	0.61
3548.00	10.66	163.84	3543.46	56.38 S	5.73 E	6.04	1.96
3643.00	12.56	167.93	3636.52	74.92 S	10.33 E	5.36	2.18
3738.00	12.95	167.95	3729.17	95.43 S	14.72 E	5.31	0.41
3833.00	13.36	164.19	3821.68	116.40 S	19.93 E	4.54	1.00
3928.00	11.72	167.93	3914.41	136.40 S	24.94 E	3.77	1.92
4023.00	12.36	166.47	4007.32	155.72 S	29.33 E	3.46	0.75
4118.00	12.56	166.20	4100.08	175.64 S	34.18 E	2.84	0.22
4213.00	12.59	174.16	4192.81	195.98 S	37.70 E	3.59	1.82
4308.00	13.23	169.92	4285.41	216.98 S	40.65 E	5.04	1.21
4403.00	13.42	176.95	4377.86	238.70 S	43.14 E	7.09	1.72
4498.00	13.25	170.73	4470.30	260.46 S	45.48 E	9.29	1.52
4593.00	12.57	174.53	4562.90	281.49 S	48.22 E	10.96	1.15
4688.00	13.21	175.01	4655.51	302.60 S	50.15 E	13.43	0.68
4783.00	12.30	172.36	4748.16	323.44 S	52.44 E	15.49	1.14
4878.00	12.60	167.33	4840.93	343.58 S	56.06 E	16.11	1.18
4973.00	13.65	177.32	4933.46	364.89 S	58.86 E	17.78	2.63
5068.00	13.77	175.02	5025.75	387.35 S	60.36 E	20.94	0.59
5163.00	13.15	175.43	5118.15	409.38 S	62.21 E	23.69	0.65
5258.00	12.74	180.00	5210.73	430.63 S	63.07 E	27.24	1.16
5353.00	11.63	173.76	5303.60	450.63 S	64.11 E	30.35	1.81
5448.00	12.70	173.48	5396.46	470.51 S	66.33 E	32.28	1.13
5543.00	13.23	165.84	5489.05	491.43 S	70.18 E	32.84	1.89
5638.00	13.64	167.90	5581.45	512.92 S	75.19 E	32.38	0.67
5733.00	13.09	167.47	5673.87	534.38 S	79.87 E	32.23	0.59
5828.00	13.64	167.51	5766.30	555.82 S	84.62 E	32.00	0.57
5922.00	12.41	174.34	5857.89	576.69 S	88.02 E	32.99	2.09
6015.00	14.77	175.88	5948.28	598.46 S	89.85 E	35.69	2.57
6110.00	16.59	180.43	6039.74	624.10 S	90.62 E	40.24	2.31
6158.00	21.00	190.73	6085.18	639.42 S	88.97 E	45.02	11.48
6205.00	24.07	200.48	6128.60	656.68 S	84.04 E	53.40	10.27
6253.00	26.20	204.82	6172.06	675.47 S	76.17 E	64.99	5.87
6300.00	27.78	208.94	6213.94	694.48 S	66.51 E	78.37	5.21
6348.00	30.17	214.53	6255.94	714.21 S	54.26 E	94.43	7.52
6395.00	34.24	218.92	6295.71	734.24 S	39.25 E	113.25	9.97
6443.00	37.69	224.32	6334.56	755.25 S	20.50 E	135.93	9.76
6490.00	39.64	227.02	6371.26	775.76 S	0.50 W	160.72	5.49
6538.00	42.30	234.30	6407.52	795.64 S	24.84 W	188.64	11.38
6585.00	44.15	240.55	6441.78	812.92 S	51.95 W	218.74	9.91
6633.00	48.06	244.23	6475.06	828.91 S	82.60 W	252.03	9.85
6680.00	52.24	248.26	6505.18	843.40 S	115.63 W	287.34	11.07
6728.00	55.53	253.74	6533.48	855.98 S	152.28 W	325.79	11.48
6775.00	58.38	258.71	6559.12	865.33 S	190.52 W	365.15	10.73
6823.00	61.13	263.25	6583.30	871.81 S	231.46 W	406.54	9.99
6870.00	64.76	264.98	6604.68	876.09 S	273.09 W	448.15	8.38
6918.00	69.70	265.52	6623.25	879.75 S	317.18 W	492.05	10.34
6965.00	74.73	265.58	6637.60	883.22 S	361.79 W	536.41	10.70
7013.00	78.88	267.05	6648.56	886.22 S	408.41 W	582.65	9.15
7055.00	82.43	268.71	6655.38	887.75 S	449.82 W	623.48	9.31
7143.00	87.16	272.00	6663.36	887.19 S	537.42 W	709.07	6.54
7238.00	87.65	269.68	6667.66	885.80 S	632.30 W	801.63	2.49
7333.00	88.09	268.39	6671.19	887.40 S	727.22 W	894.83	1.43
7428.00	88.30	267.87	6674.18	890.50 S	822.12 W	988.32	0.59
7522.00	89.30	267.75	6676.16	894.09 S	916.03 W	1080.95	1.07
7617.00	89.94	267.38	6676.79	898.13 S	1010.94 W	1174.65	0.79
7712.00	90.95	267.19	6676.04	902.63 S	1105.83 W	1268.42	1.08
7807.00	89.54	267.49	6675.63	907.04 S	1200.73 W	1362.18	1.52
7902.00	89.04	267.23	6676.80	911.41 S	1295.62 W	1455.93	0.59
7997.00	90.03	267.26	6677.57	915.98 S	1390.50 W	1549.71	1.04
8092.00	88.60	266.61	6678.71	921.06 S	1485.36 W	1643.57	1.66
8187.00	88.65	268.01	6680.99	925.51 S	1580.22 W	1737.31	1.47
8282.00	88.68	267.49	6683.21	929.24 S	1675.12 W	1830.93	0.55

8377.00	88.43	268.42	6685.60	932.63 S	1770.03 W	1924.50	1.01
8471.00	89.53	268.49	6687.27	935.17 S	1863.98 W	2016.94	1.17
8566.00	90.20	269.17	6687.49	937.11 S	1958.96 W	2110.28	1.01
8661.00	89.92	269.11	6687.39	938.53 S	2053.95 W	2203.51	0.30
8756.00	90.00	268.86	6687.45	940.21 S	2148.93 W	2296.79	0.28
8851.00	90.71	269.08	6686.86	941.92 S	2243.92 W	2390.08	0.78
8946.00	91.16	268.91	6685.31	943.59 S	2338.89 W	2483.35	0.51
9041.00	90.81	269.20	6683.68	945.15 S	2433.86 W	2576.60	0.48
9135.00	90.50	270.26	6682.60	945.60 S	2527.85 W	2668.66	1.17
9230.00	90.85	270.37	6681.48	945.08 S	2622.85 W	2761.49	0.39
9325.00	90.31	270.13	6680.52	944.66 S	2717.84 W	2854.35	0.62
9420.00	90.90	270.23	6679.52	944.36 S	2812.83 W	2947.23	0.63
9515.00	91.60	270.10	6677.45	944.09 S	2907.81 W	3040.11	0.75
9610.00	90.69	269.95	6675.55	944.05 S	3002.79 W	3133.03	0.97
9705.00	89.82	268.99	6675.13	944.93 S	3097.78 W	3226.16	1.36
9800.00	88.78	268.41	6676.29	947.08 S	3192.75 W	3319.52	1.25
9895.00	90.56	269.63	6676.83	948.71 S	3287.73 W	3412.79	2.27
9990.00	88.81	269.02	6677.36	949.83 S	3382.72 W	3505.96	1.95
10085.00	89.50	269.45	6678.76	951.09 S	3477.70 W	3599.15	0.86
10179.00	90.13	268.98	6679.06	952.38 S	3571.69 W	3691.38	0.84
10274.00	89.15	268.77	6679.66	954.25 S	3666.66 W	3784.70	1.05
10369.00	89.17	267.28	6681.05	957.52 S	3761.60 W	3878.26	1.57
10464.00	90.31	266.21	6681.48	962.91 S	3856.44 W	3972.17	1.65
10559.00	89.82	266.01	6681.37	969.36 S	3951.22 W	4066.24	0.56
10654.00	89.91	265.96	6681.60	976.01 S	4045.99 W	4160.33	0.11
10749.00	89.40	266.60	6682.16	982.17 S	4140.78 W	4254.36	0.86
10844.00	90.54	267.64	6682.21	986.95 S	4235.66 W	4348.18	1.63
10939.00	90.91	269.65	6681.00	989.19 S	4330.62 W	4441.55	2.15
11033.00	89.49	268.39	6680.67	990.80 S	4424.60 W	4533.84	2.02
11138.00	89.85	266.94	6681.28	995.08 S	4529.51 W	4637.37	1.42
11201.00	89.85	266.94	6681.44	998.44 S	4592.42 W	4699.62	0.00

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 258.08 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 11201.00 FEET
IS 4699.70 FEET ALONG 257.73 DEGREES (GRID)**