



WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	10-Aug-13	11-Aug-13			
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)	641.00	5,993.89			
Log End Depth (TVD, ft)	5,993.89	6,629.94			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	09-Aug-13 09:45	10-Aug-13 12:00			
Drill/Wipe End Date and Time	10-Aug-13 03:30	11-Aug-13 04:30			
Min Inc (deg) @ Depth (TVD, ft)	.13 @ 718.00	6.98 @ 6,033.58			
Max Inc (deg) @ Depth (TVD, ft)	12.36 @ 4,066.38	81.73 @ 6,622.87			
Bit TFA(in2) / Bit Type	.86 / PDC	.86 / PDC			
Flow Rate (gpm)	574.71	561.59			
Max AV (fpm) / CV (fpm) @ MWD	386.2 / 500.0	373.8 / 425.0			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.90 / 27.00	10.00 / 34.00			
Filtrate CL (ppm)	1,700.00	2,400.00			
pH / Fluid Loss (mptm)	13.10 / 42	9.60 / 8			
PV (cP) / YP (Ihf2)	4 / 2.00	10 / 10.00			
% Solids / % Sand	3.70 / 0.15	12.2 / 0.25			
% Oil / Oil:Water Ratio	0 / 0:95	0 / 0:95			
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA			
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA			
Max Tool Temp (deg F) / S	145.00 / PDM	170.70 / PDM			

Max Tool Temp (degF) / Source	145.90 / PCM	172.78 / PCM			
Rm @ Max Tool Temp (degF)	NA @ NA	NA @ NA			
Lead MWD Engineer	Brett Vandergon	Brett Vandergon			
Customer Representative	Johnny Sanchez	Johnny Sanchez			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11404301	11404301			
Insert Serial Number	11399998	11399998			
Date and Time Initialized	08-Aug-13 19:56	01-Jan-70 00:00			
Date and Time Read	11-Aug-13 10:16	11-Aug-13 10:23			
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	11404301	11404301			
Sonde Serial Number	11062116	11062116			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	14.29	43.73			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.76	46.87			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404301	11404301			
Insert/Sonde Serial Number	11579774	11579774			

## REMARKS

1. All depths are true vertical bit 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. Surveys at MD 360' and 615' were done by gyro.

7. INSITE version 7.4.2

## WARRANTY

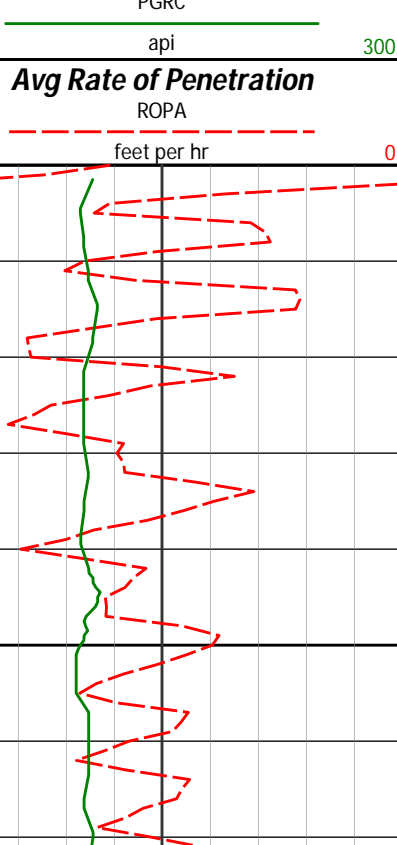
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES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

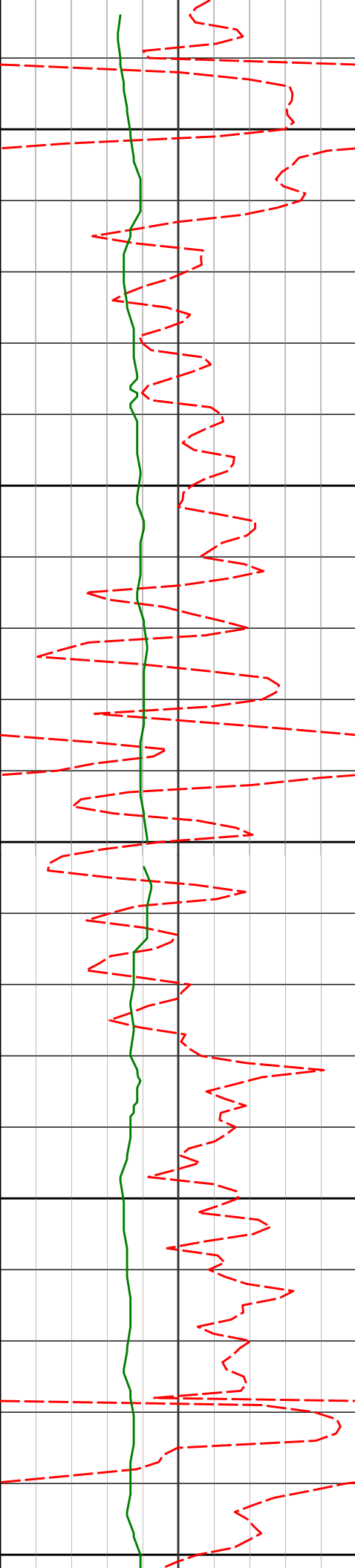
# HALLIBURTON

Sperry Drilling Services

## TVD Detail Log 1:240

Noble Energy  
Wells Ranch USX AA13-65-1HN  
H&P 343  
T6N-R62W

PCG Gamma Ray PGRC 0 300 api						
Avg Rate of Penetration ROPA 1K 0 feet per hr		Depth ft	Depth	Inc.	Azi.	TVD V.S.
		3057	3057'	9.97°	344.79°	3037.01' 103.09'
		3050				



3100

3152'

8.86°

345.53°

3130.73'

109.28'

3150

3200

3247'

8.83°

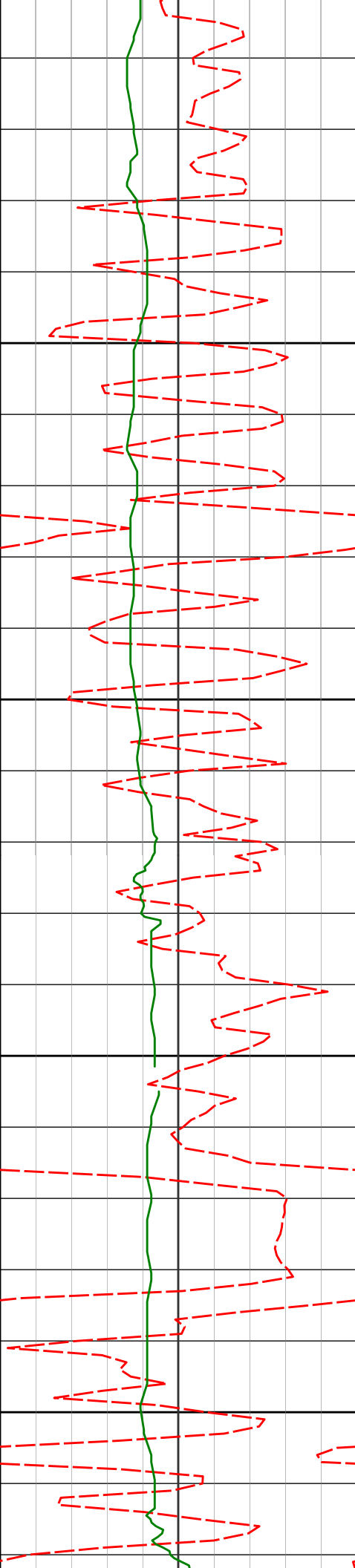
347.31°

3224.60'

114.79'

3250

3300



3342'

8.65°

347.83°

3318.50'

119.97'

3350

3400

3437'

7.62°

341.39°

3412.54'

125.39'

3450

3500

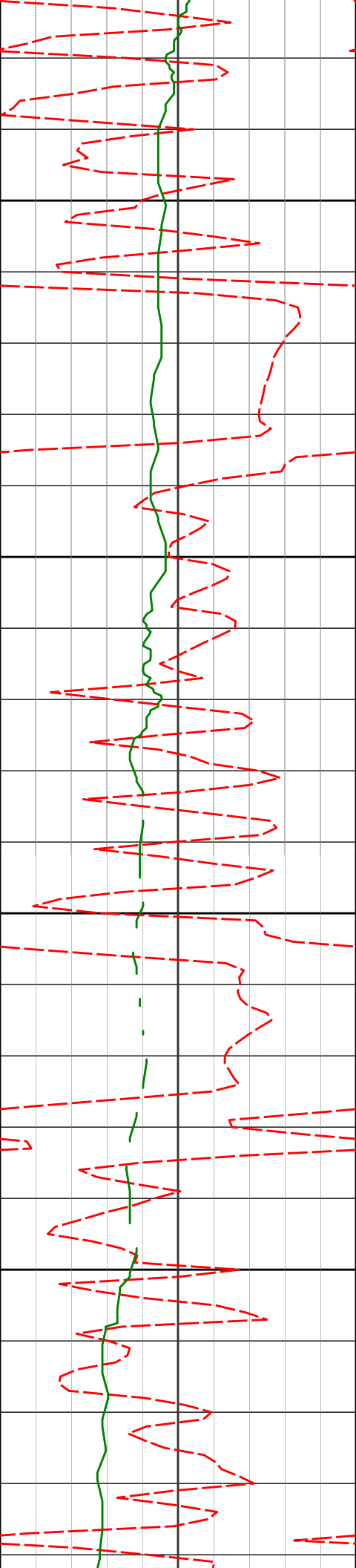
3531'

7.44°

340.96°

3505.73'

131.07'



3550

3600

3650

3700

3626'

8.09°

346.19°

3599.86'

136.47'

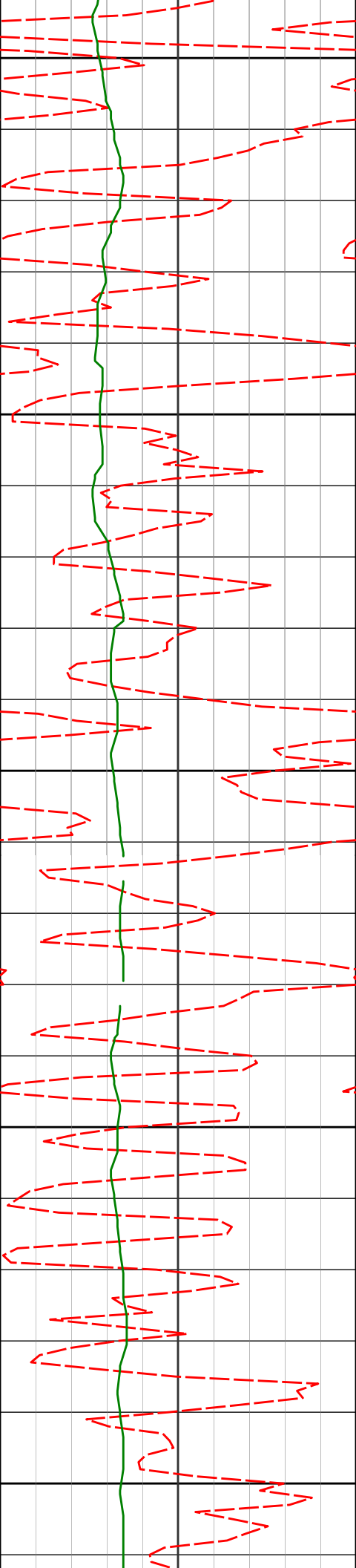
3721'

9.59°

342.26°

3693.73'

142.54'



3750

3800

3850

3900

3950

3816'

10.71°

344.47°

3787.24'

149.66'

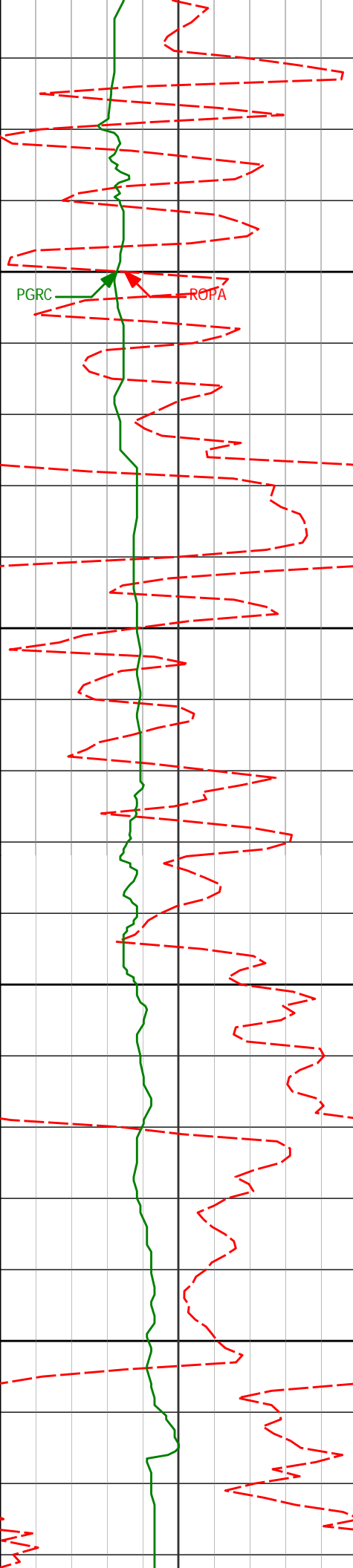
3911'

11.42°

345.80°

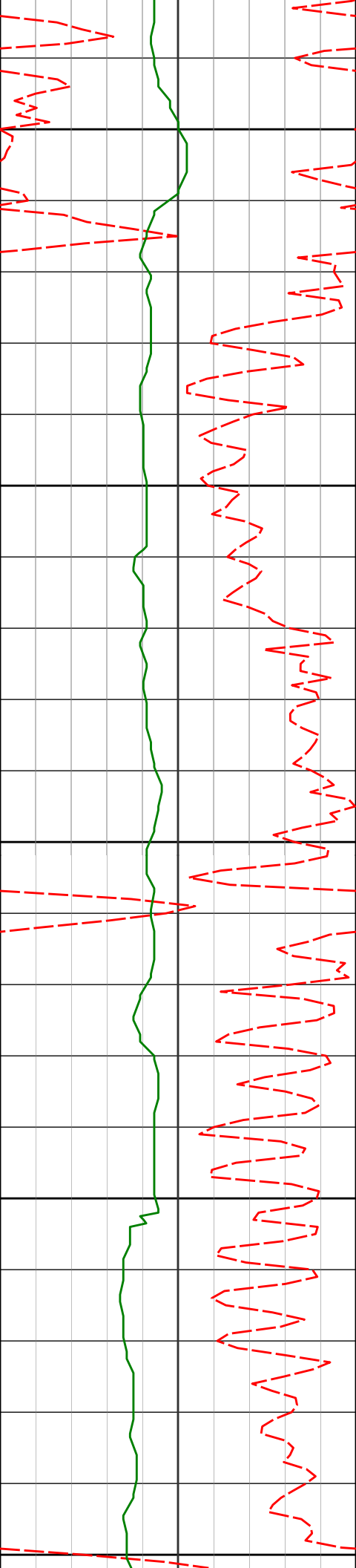
3880.47'

156.92'



4006'	11.93°	346.17°	3973.51'	164.31'
4000				
4050				
4101'	12.36°	347.19°	4066.38'	171.77'
4100				
4150				
4196'	11.57°	349.95°	4159.32'	178.54'





4200

4250

4300

4350

4400

4291'

10.02°

348.86°

4252.63'

184.38'

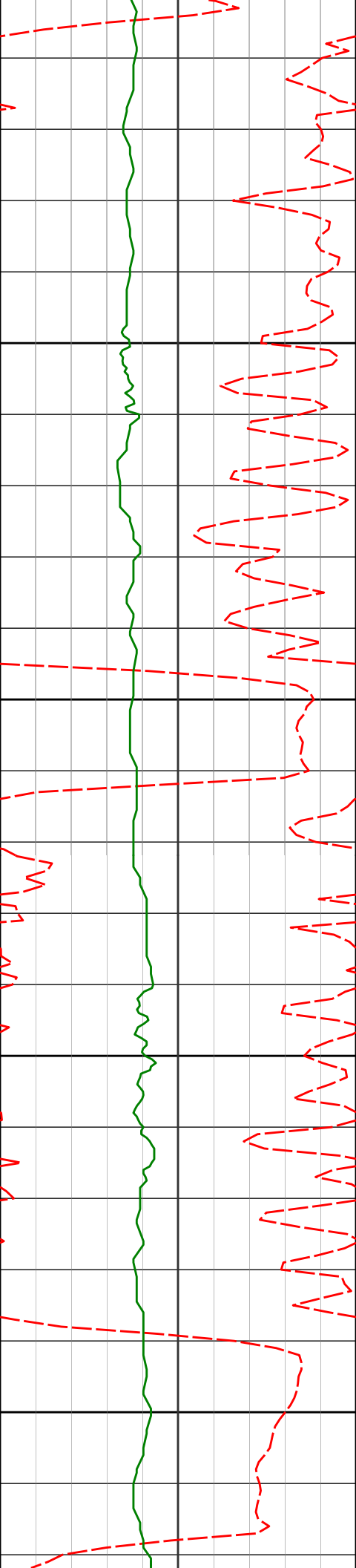
4386'

8.50°

350.74°

4346.39'

189.33'



4481'

7.55°

353.52°

4440.46'

193.11'

4450

4500

4576'

7.04°

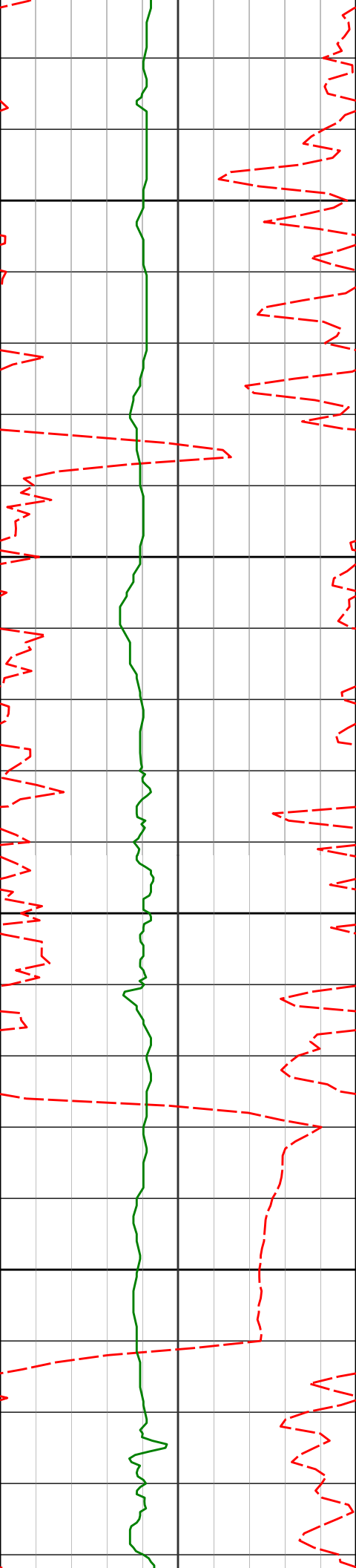
349.39°

4534.69'

196.65'

4550

4600



4671'

8.29°

341.13°

4628.85'

201.72'

4650

4700

4765'

6.91°

345.55°

4722.02'

207.07'

4750

4800

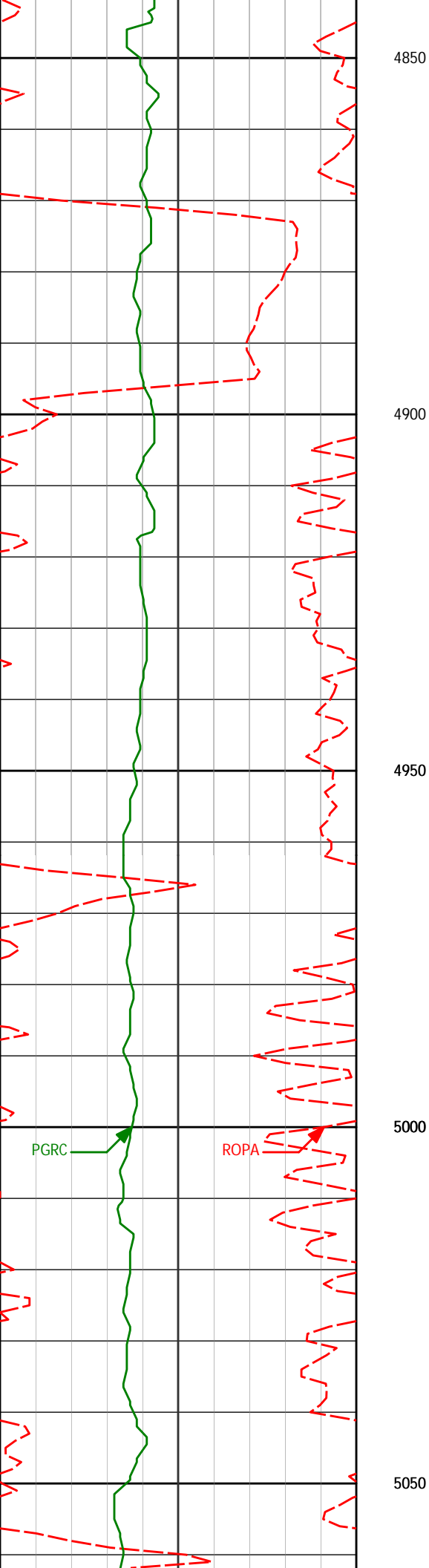
4860'

8.86°

343.89°

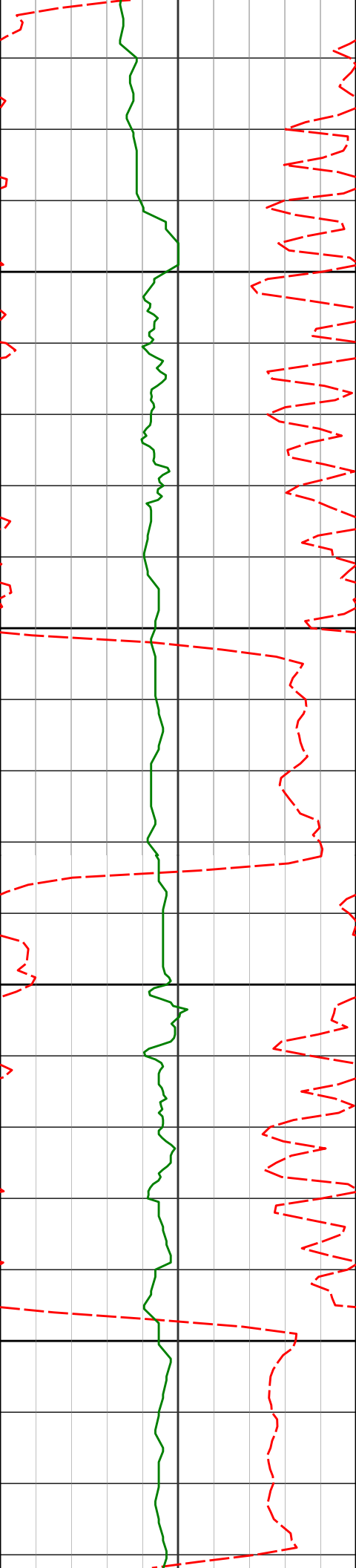
4816.11'

212.37'



4955'	9.34°	350.24°	4909.92'	217.86'
-------	-------	---------	----------	---------

5050'	8.58°	350.08°	5003.76'	222.54'
-------	-------	---------	----------	---------



5100

5150

5200

5250

5145'

7.32°

354.21°

5097.85'

226.30'

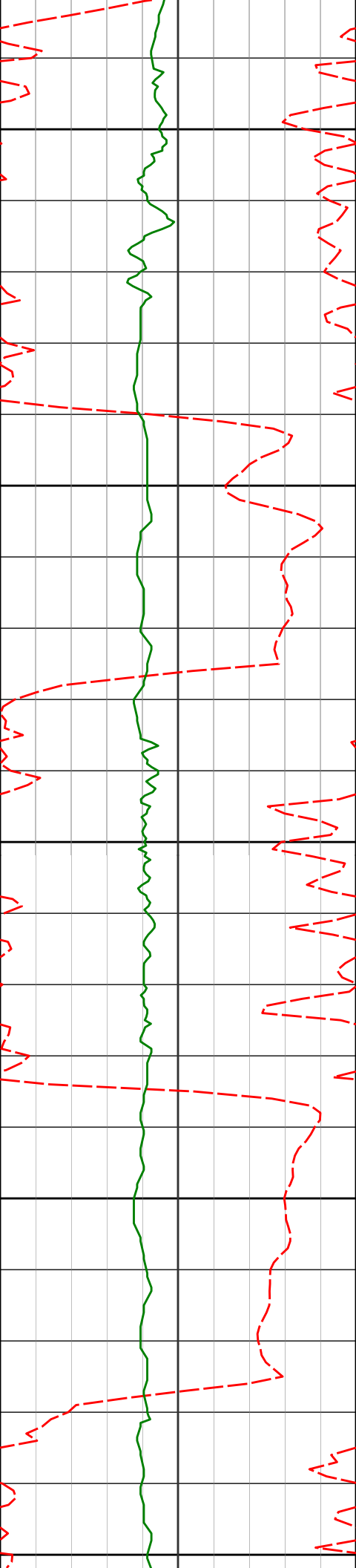
5240'

6.87°

352.25°

5192.12'

229.41'



5335'

8.20°

349.37°

5286.30'

233.24'

5300

5350

5430'

7.96°

349.74°

5380.35'

237.60'

5400

5450

5524'

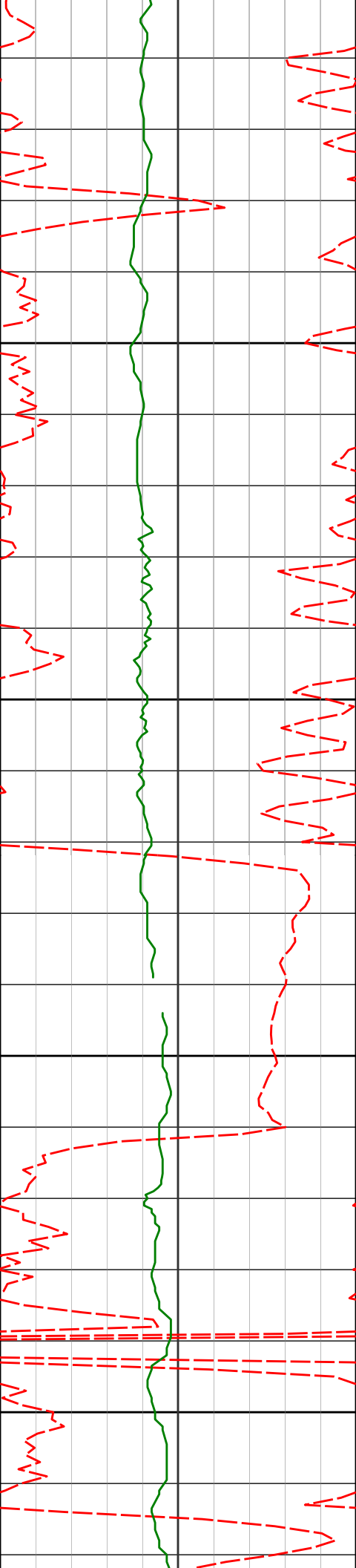
9.18°

343.12°

5473.30'

242.93'

5500



5550

5600

5650

5700

5619'

7.53°

340.93°

5567.29'

249.08'

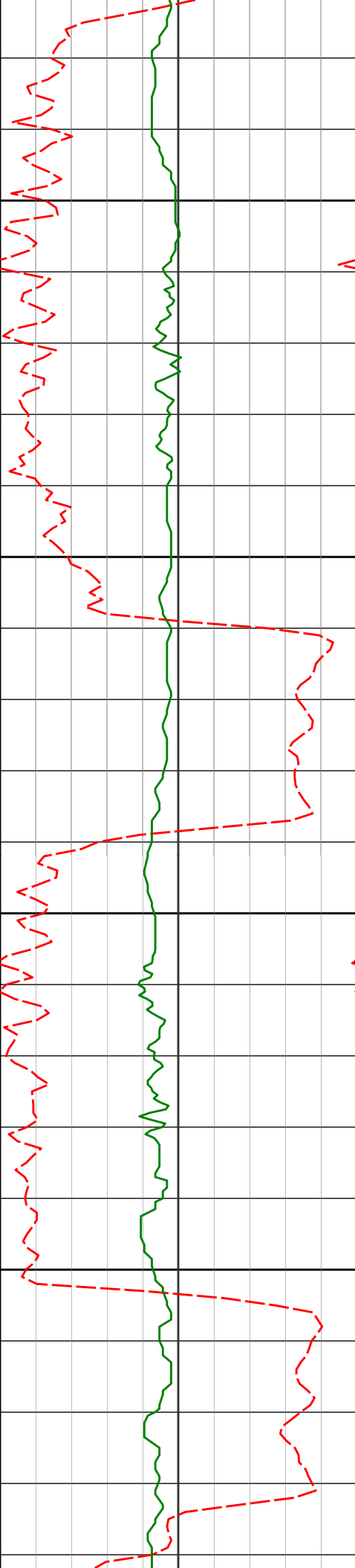
5714'

9.61°

336.36°

5661.23'

256.21'



5750

5809'

7.86°

336.58°

5755.12'

263.89'

5800

5850

5904'

7.90°

336.06°

5849.22'

270.85'

5900

5994'

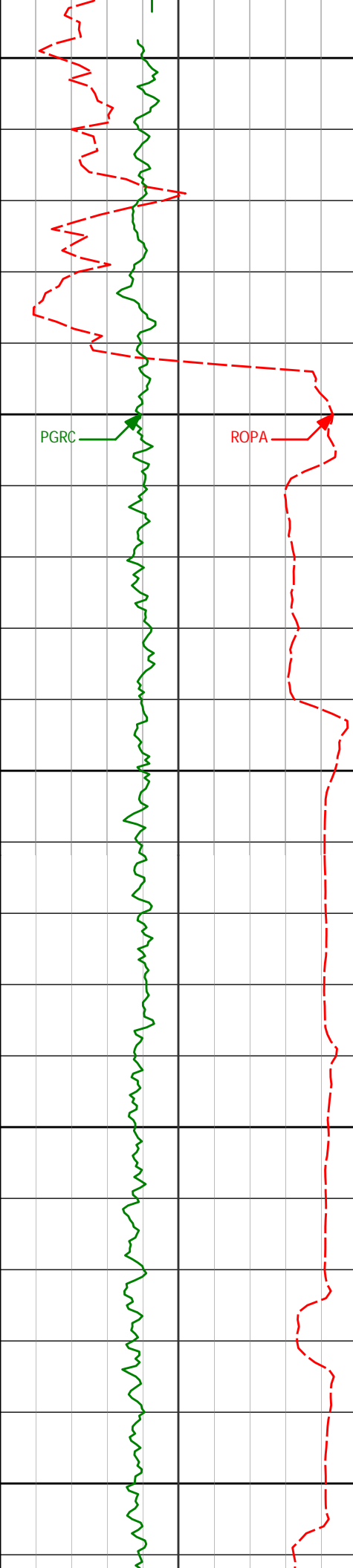
7.83°

339.49°

5938.38'

277.16'





Run 200

5950

6000

6050

6100

6150

PGRC

ROPA

6090'

6.98°

330.57°

6033.58'

283.94'

6138'

11.45°

308.86°

6080.96'

289.86'

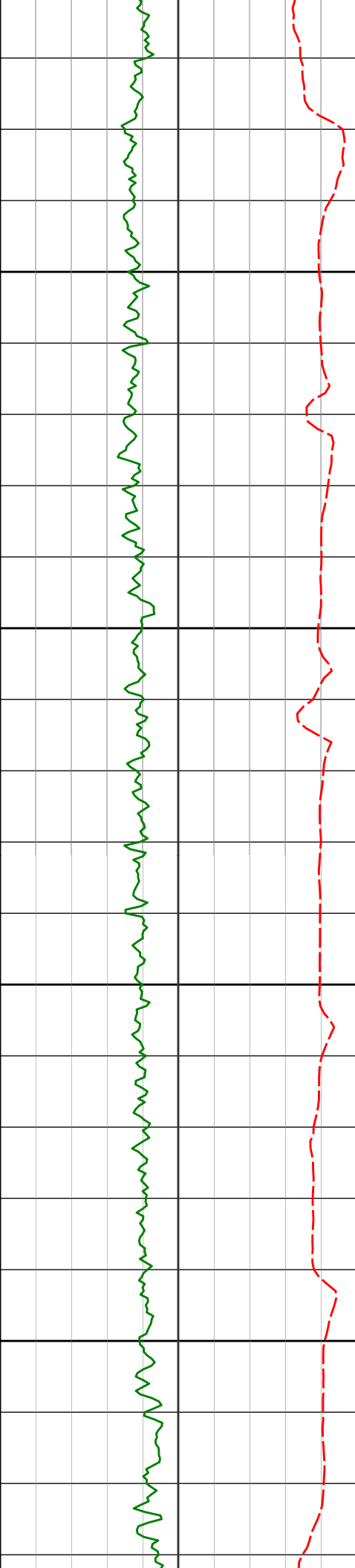
6185'

16.11°

302.01°

6126.60'

299.88'



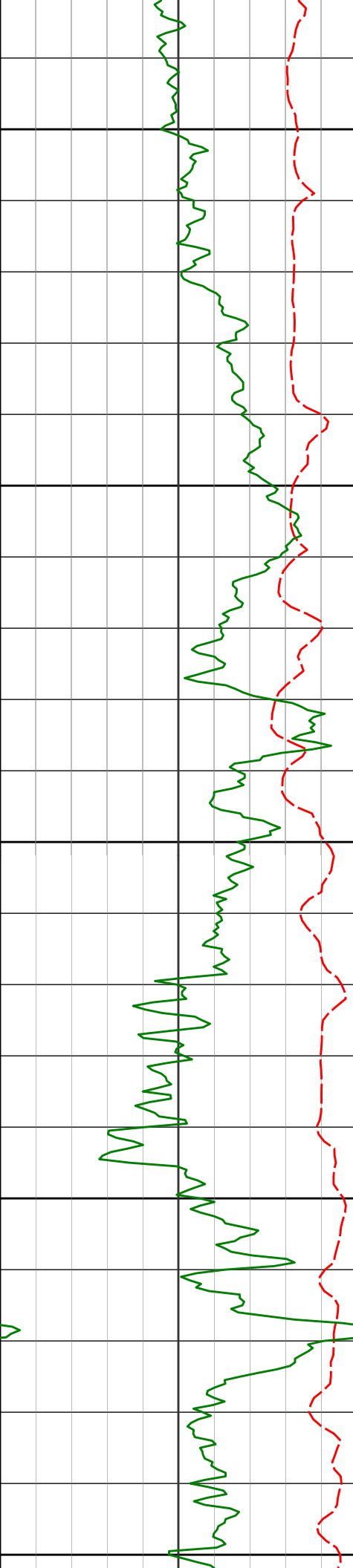
6200

6250

6300

6350

6233'	18.83°	299.26°	6172.38'	313.24'
6280'	22.81°	297.36°	6216.30'	328.97'
6328'	27.62°	297.64°	6259.72'	348.31'
6375'	32.96°	296.92°	6300.29'	370.76'
6423'	40.39°	295.46°	6338.76'	398.08'
6470'	47.51°	297.92°	6372.58'	429.05'



6400

6518'

49.04°

298.15°

6404.52'

462.84'

6565'

49.92°

297.29°

6435.06'

496.60'

6450

6613'

54.16°

294.74°

6464.58'

532.70'

6660'

58.22°

291.80°

6490.73'

570.48'

6500

6708'

59.78°

287.84°

6515.45'

610.83'

6755'

60.78°

286.98°

6538.75'

651.16'

6550

6803'

64.20°

282.47°

6560.93'

693.47'

6850'

67.44°

277.92°

6580.19'

736.31'

6898'

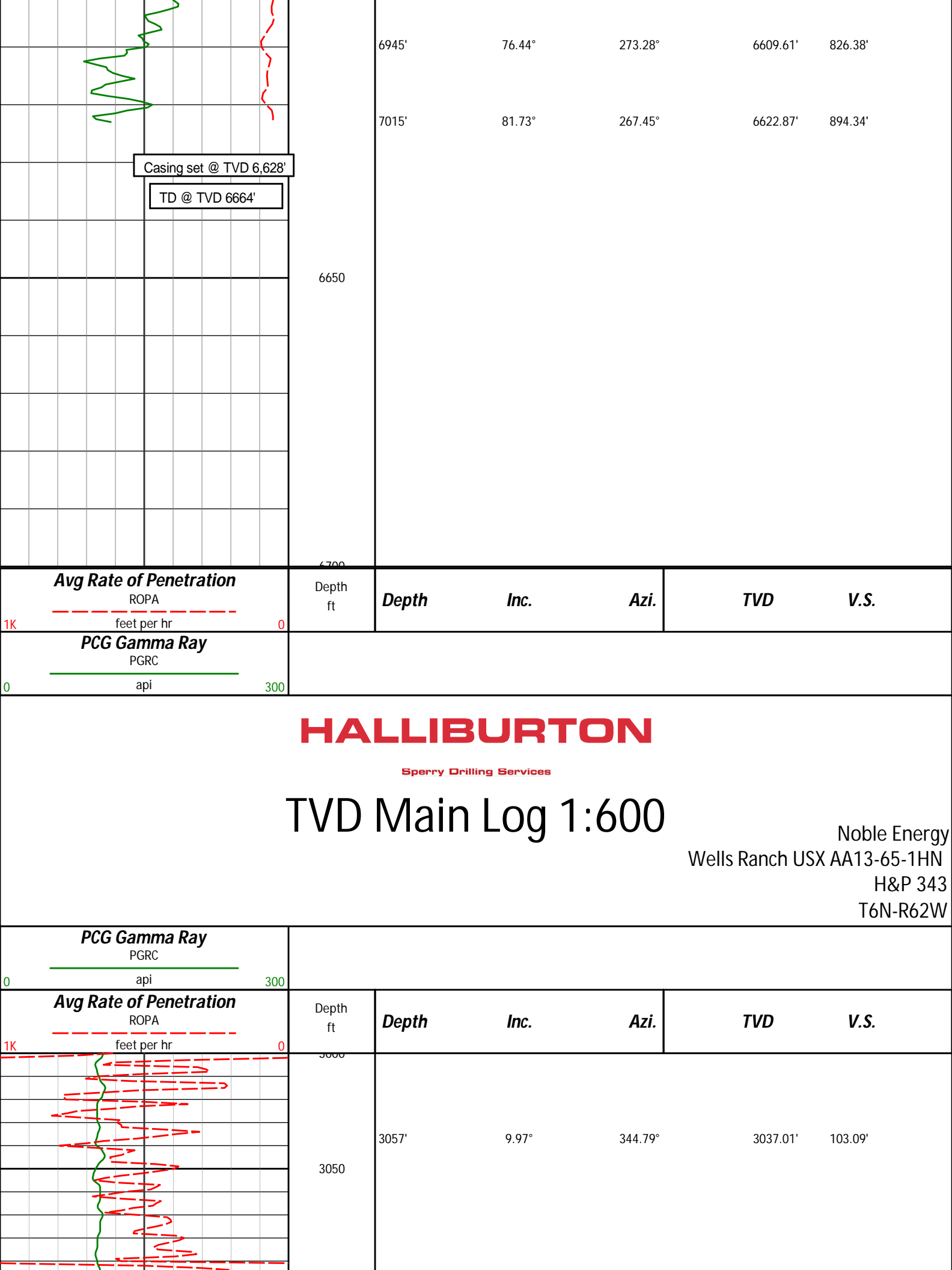
71.99°

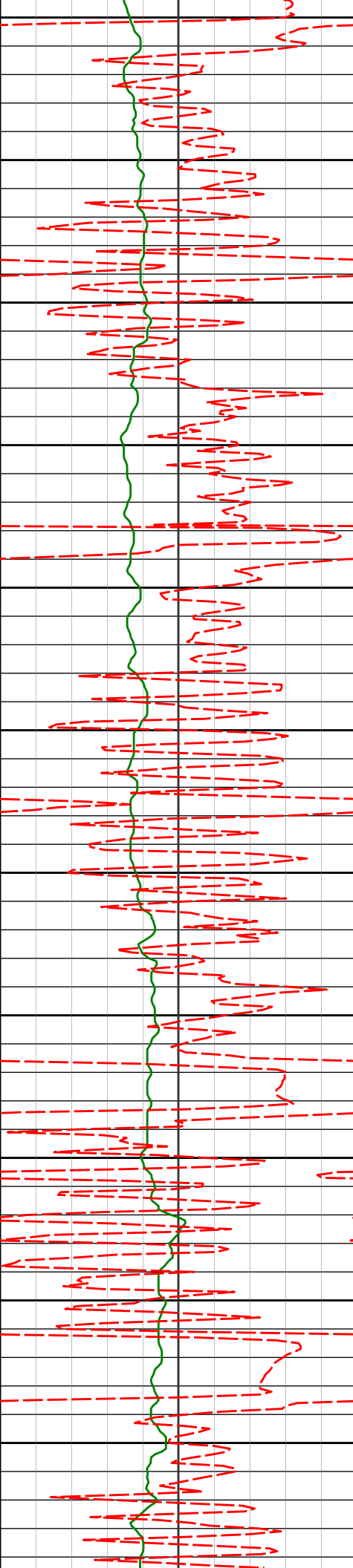
275.33°

6596.83'

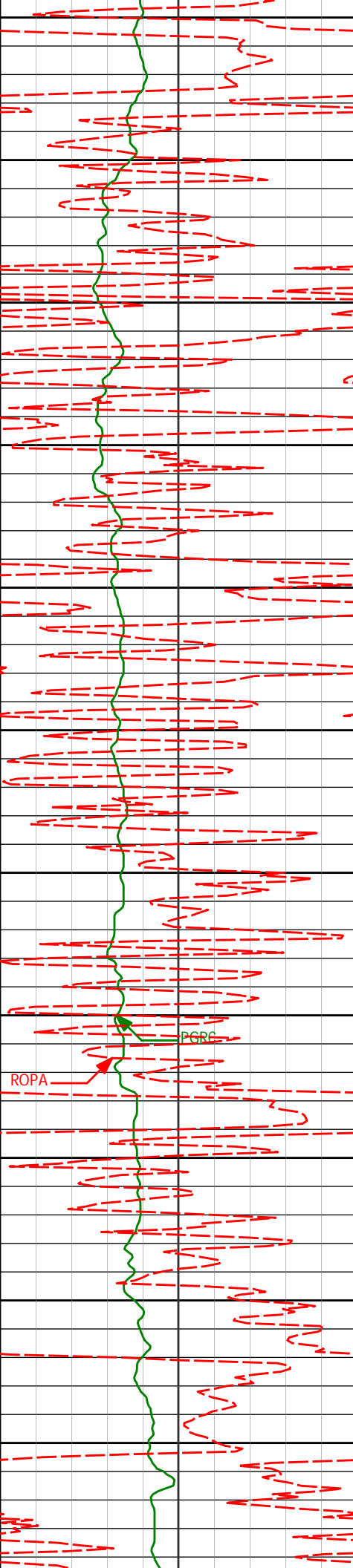
781.29'

6600





3100				
3152'	8.86°	345.53°	3130.73'	109.28'
3150				
3200				
3247'	8.83°	347.31°	3224.60'	114.79'
3250				
3300				
3342'	8.65°	347.83°	3318.50'	119.97'
3350				
3400				
3437'	7.62°	341.39°	3412.54'	125.39'
3450				
3500				
3531'	7.44°	340.96°	3505.73'	131.07'
3550				
3600				
3626'	8.09°	346.19°	3599.86'	136.47'



3650

3700

3750

3800

3850

3900

3950

4000

4050

4100

4150

3721'

9.59°

342.26°

3693.73'

142.54'

3816'

10.71°

344.47°

3787.24'

149.66'

3911'

11.42°

345.80°

3880.47'

156.92'

4006'

11.93°

346.17°

3973.51'

164.31'

4101'

12.36°

347.19°

4066.38'

171.77'

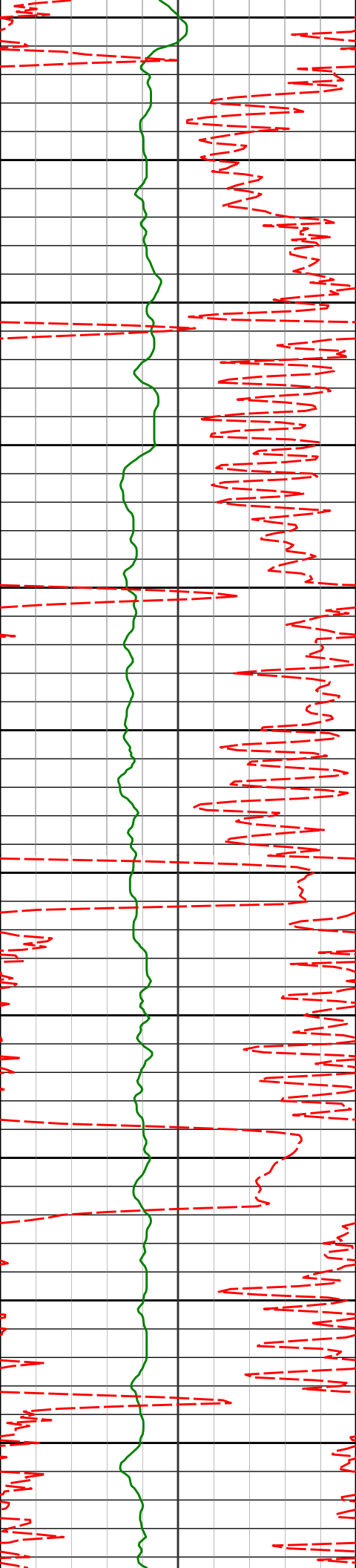
4196'

11.57°

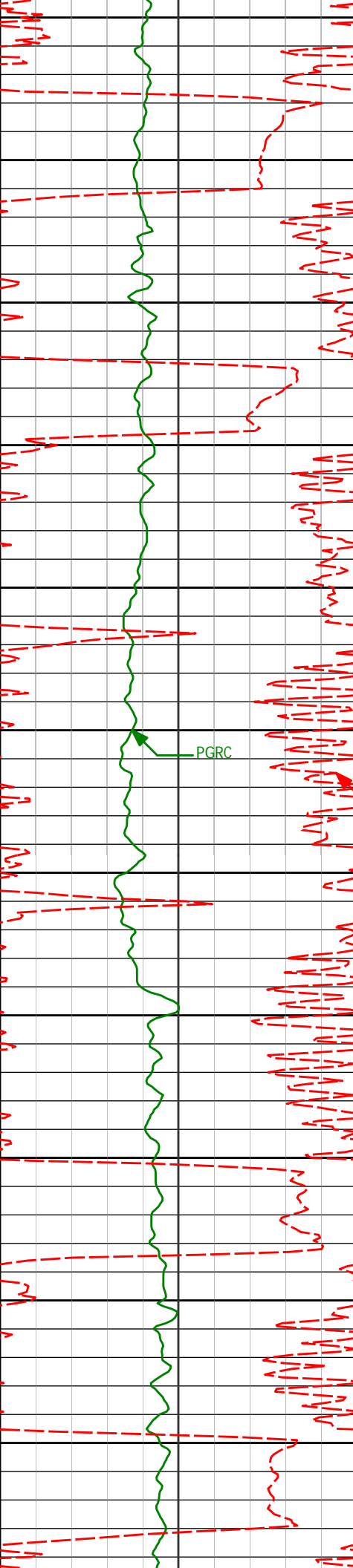
349.95°

4159.32'

178.54'

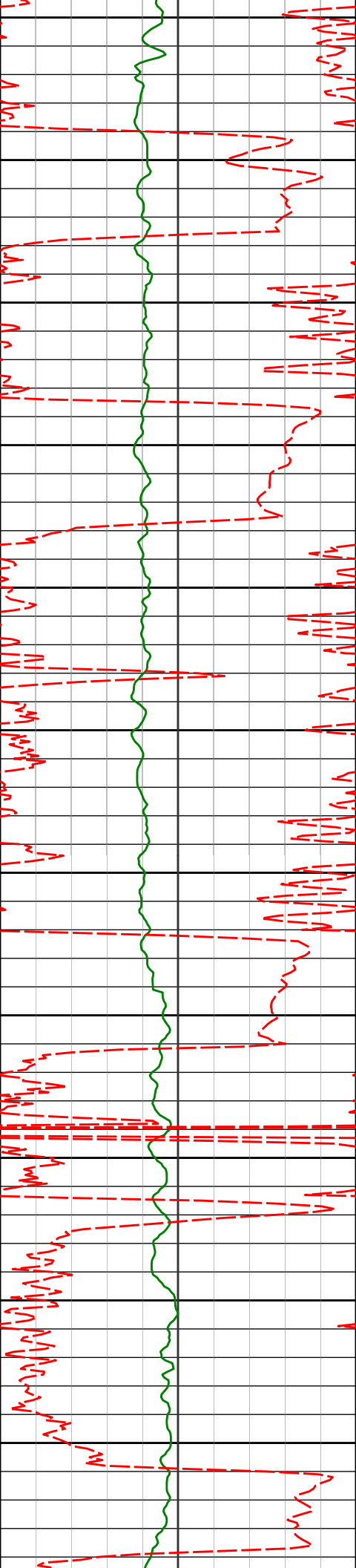


4291'	10.02°	348.86°	4252.63'	184.38'
4386'	8.50°	350.74°	4346.39'	189.33'
4481'	7.55°	353.52°	4440.46'	193.11'
4576'	7.04°	349.39°	4534.69'	196.65'
4671'	8.29°	341.13°	4628.85'	201.72'
4765'	6.91°	345.55°	4722.02'	207.07'



4860'	8.86°	343.89°	4816.11'	212.37'
4955'	9.34°	350.24°	4909.92'	217.86'
5050'	8.58°	350.08°	5003.76'	222.54'
5145'	7.32°	354.21°	5097.85'	226.30'
5240'	6.87°	352.25°	5192.12'	229.41'
5335'	8.20°	349.37°	5286.30'	233.24'





5300

5350

5430'

7.96°

349.74°

5380.35'

237.60'

5400

5450

5524'

9.18°

343.12°

5473.30'

242.93'

5500

5550

5619'

7.53°

340.93°

5567.29'

249.08'

5600

5650

5714'

9.61°

336.36°

5661.23'

256.21'

5700

5750

5809'

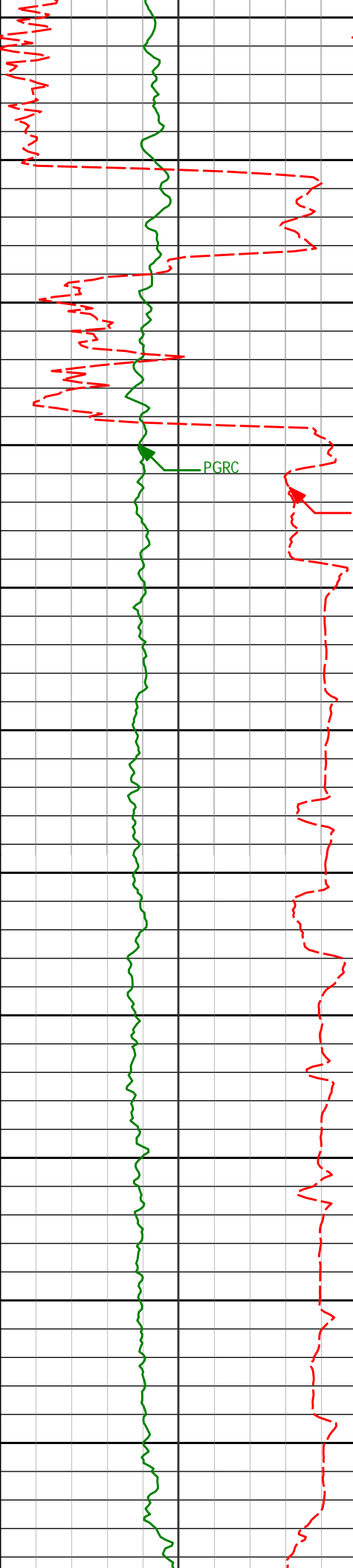
7.86°

336.58°

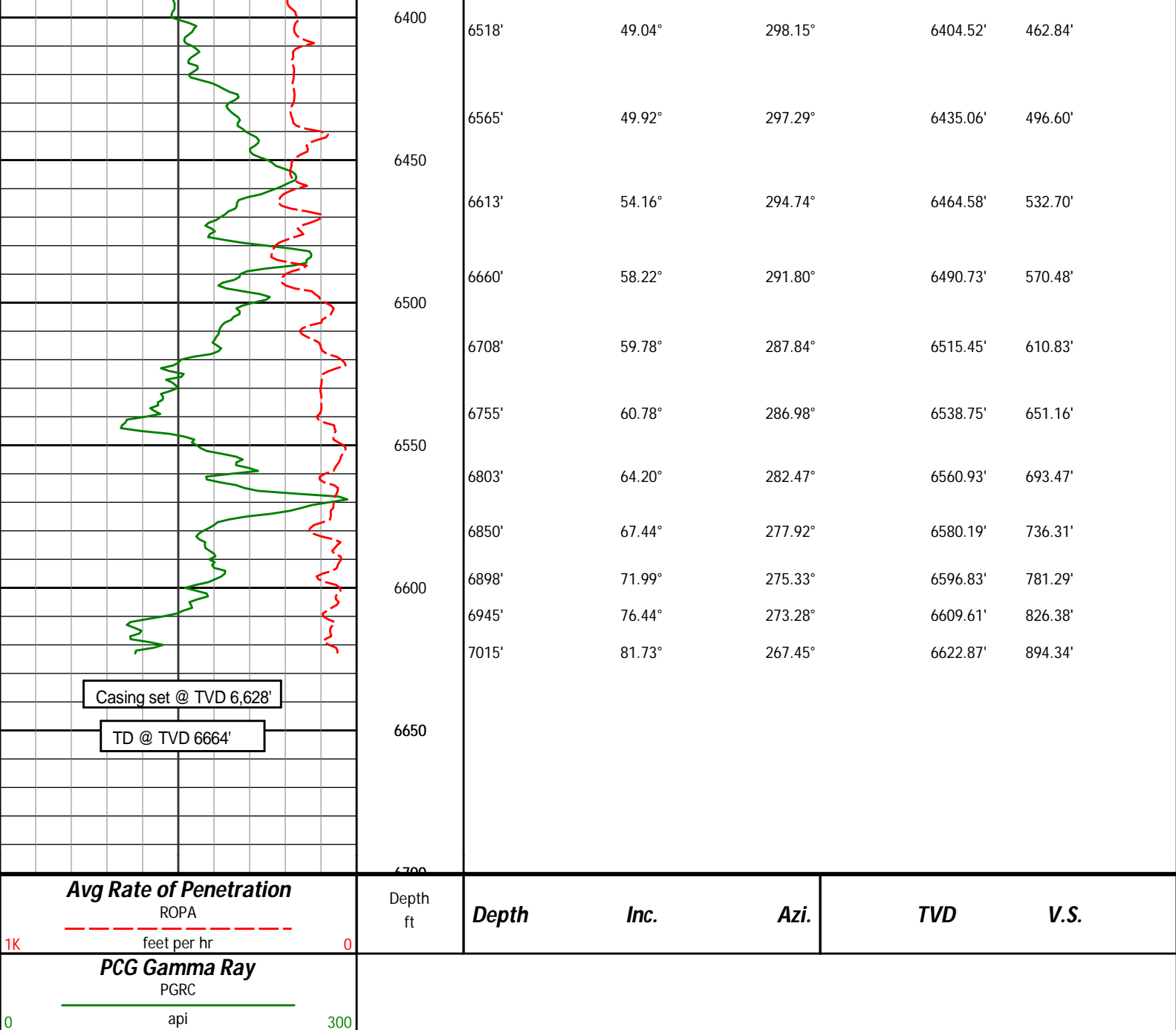
5755.12'

263.89'

5800



5850	5904'	7.90°	336.06°	5849.22'	270.85'
5900					
5950	5994'	7.83°	339.49°	5938.38'	277.16'
6000					
6050	6090'	6.98°	330.57°	6033.58'	283.94'
6100	6138'	11.45°	308.86°	6080.96'	289.86'
6150	6185'	16.11°	302.01°	6126.60'	299.88'
6200	6233'	18.83°	299.26°	6172.38'	313.24'
6250	6280'	22.81°	297.36°	6216.30'	328.97'
6300	6328'	27.62°	297.64°	6259.72'	348.31'
6350	6375'	32.96°	296.92°	6300.29'	370.76'
	6423'	40.39°	295.46°	6338.76'	398.08'
	6470'	47.51°	297.92°	6372.58'	429.05'



## HALLIBURTON

### DIRECTIONAL SURVEY REPORT

Noble  
Wells Ranch USX AA13-65-1HN  
Wattenburg  
Weld Colorado  
USA  
CA-XX-0900630174

Surveys are tied into two non-Halliburton surveys at MD 375' and 620' taken with a gyro while drilling surface hole.

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
375.00	0.20	94.07	375.00	0.05 S	0.65 E	-0.65	0.05
620.00	0.20	253.47	620.00	0.20 S	0.67 E	-0.69	0.16
718.00	0.13	146.85	718.00	0.34 S	0.57 E	-0.61	0.27
810.00	0.28	155.70	810.00	0.63 S	0.72 E	-0.80	0.16
903.00	0.37	112.12	903.00	0.95 S	1.09 E	-1.22	0.28

997.00	0.82	167.88	996.99	1.72 S	1.51 E	-1.75	0.73
1089.00	0.86	168.22	1088.98	3.04 S	1.79 E	-2.22	0.04
1181.00	0.69	174.90	1180.97	4.26 S	1.98 E	-2.60	0.20
1273.00	0.89	201.53	1272.97	5.48 S	1.77 E	-2.57	0.45
1365.00	2.76	325.65	1364.93	4.32 S	0.26 E	-0.90	3.63
1457.00	5.09	334.07	1456.71	1.18 N	2.78 W	2.92	2.60
1550.00	6.78	338.90	1549.21	10.01 N	6.56 W	7.98	1.90
1642.00	8.95	342.51	1640.34	21.91 N	10.66 W	13.82	2.42
1735.00	8.97	342.65	1732.20	35.73 N	15.00 W	20.18	0.03
1827.00	9.14	343.39	1823.06	49.57 N	19.22 W	26.43	0.22
1918.00	9.29	341.59	1912.89	63.46 N	23.61 W	32.84	0.36
2013.00	9.47	351.19	2006.62	78.46 N	27.23 W	38.67	1.66
2108.00	8.87	351.11	2100.41	93.43 N	29.56 W	43.21	0.63
2203.00	8.65	351.85	2194.30	107.74 N	31.70 W	47.48	0.26
2298.00	9.15	347.59	2288.15	122.19 N	34.34 W	52.24	0.87
2393.00	9.04	344.46	2381.96	136.75 N	37.96 W	58.01	0.53
2487.00	8.88	344.21	2474.81	150.85 N	41.92 W	64.03	0.17
2582.00	8.73	344.36	2568.69	164.85 N	45.85 W	70.02	0.16
2677.00	9.69	342.34	2662.47	179.40 N	50.22 W	76.51	1.06
2772.00	9.83	344.61	2756.09	194.84 N	54.80 W	83.35	0.43
2867.00	9.53	344.38	2849.74	210.24 N	59.07 W	89.88	0.32
2962.00	9.69	344.00	2943.41	225.50 N	63.39 W	96.44	0.19
3057.00	9.97	344.79	3037.01	241.12 N	67.75 W	103.09	0.32
3152.00	8.86	345.53	3130.73	256.15 N	71.74 W	109.28	1.18
3247.00	8.83	347.31	3224.60	270.34 N	75.17 W	114.79	0.29
3342.00	8.65	347.83	3318.50	284.43 N	78.28 W	119.97	0.20
3437.00	7.62	341.39	3412.54	297.39 N	81.79 W	125.39	1.45
3531.00	7.44	340.96	3505.73	309.05 N	85.77 W	131.07	0.20
3626.00	8.09	346.19	3599.86	321.36 N	89.37 W	136.47	1.01
3721.00	9.59	342.26	3693.73	335.39 N	93.38 W	142.54	1.70
3816.00	10.71	344.47	3787.24	351.44 N	98.15 W	149.66	1.24
3911.00	11.42	345.80	3880.47	369.06 N	102.83 W	156.92	0.80
4006.00	11.93	346.17	3973.51	387.72 N	107.48 W	164.31	0.53
4101.00	12.36	347.19	4066.38	407.16 N	112.08 W	171.77	0.51
4196.00	11.57	349.95	4159.32	426.46 N	116.00 W	178.54	1.03
4291.00	10.02	348.86	4252.63	443.95 N	119.26 W	184.38	1.65
4386.00	8.50	350.74	4346.39	458.99 N	121.99 W	189.33	1.63
4481.00	7.55	353.52	4440.46	472.12 N	123.82 W	193.11	1.08
4576.00	7.04	349.39	4534.69	484.05 N	125.60 W	196.65	0.77
4671.00	8.29	341.13	4628.85	496.25 N	128.88 W	201.72	1.75
4765.00	6.91	345.55	4722.02	508.15 N	132.49 W	207.07	1.59
4860.00	8.86	343.89	4816.11	520.72 N	135.95 W	212.37	2.06
4955.00	9.34	350.24	4909.92	535.35 N	139.29 W	217.86	1.17
5050.00	8.58	350.08	5003.76	549.93 N	141.81 W	222.54	0.80
5145.00	7.32	354.21	5097.85	562.93 N	143.65 W	226.30	1.46
5240.00	6.87	352.25	5192.12	574.58 N	145.02 W	229.41	0.54
5335.00	8.20	349.37	5286.30	586.87 N	147.04 W	233.24	1.45
5430.00	7.96	349.74	5380.35	600.00 N	149.46 W	237.60	0.25
5524.00	9.18	343.12	5473.30	613.58 N	152.80 W	242.93	1.66
5619.00	7.53	340.93	5567.29	626.72 N	157.03 W	249.08	1.76
5714.00	9.61	336.36	5661.23	639.87 N	162.24 W	256.21	2.30
5809.00	7.86	336.58	5755.12	653.10 N	168.01 W	263.89	1.84
5904.00	7.90	336.06	5849.22	665.03 N	173.24 W	270.85	0.09
5994.00	7.83	339.49	5938.38	676.43 N	177.90 W	277.16	0.53
6090.00	6.98	330.57	6033.58	687.63 N	183.06 W	283.94	1.48
6138.00	11.45	308.86	6080.96	693.17 N	188.21 W	289.86	11.64
6185.00	16.11	302.01	6126.60	699.55 N	197.37 W	299.88	10.48
6233.00	18.83	299.26	6172.38	706.87 N	209.78 W	313.24	5.93
6280.00	22.81	297.36	6216.30	714.77 N	224.49 W	328.97	8.59
6328.00	27.62	297.64	6259.72	724.21 N	242.63 W	348.31	10.03
6375.00	32.96	296.92	6300.29	735.06 N	263.69 W	370.76	11.37
6423.00	40.39	295.46	6338.76	747.68 N	289.41 W	398.08	15.59
6470.00	47.51	297.92	6372.58	762.36 N	318.51 W	429.05	15.59
6518.00	49.04	298.15	6404.52	779.20 N	350.13 W	462.84	3.20
6565.00	49.92	297.29	6435.06	795.82 N	381.76 W	496.60	2.34
6613.00	54.16	294.74	6464.58	812.39 N	415.77 W	532.70	9.78
6660.00	58.22	291.80	6490.73	827.79 N	451.64 W	570.48	10.07
6708.00	59.78	287.84	6515.45	841.72 N	490.34 W	610.83	7.79
6755.00	60.78	286.98	6538.75	853.93 N	529.29 W	651.16	2.64
6803.00	64.20	282.47	6560.93	864.72 N	570.45 W	693.47	10.96
6850.00	67.44	277.92	6580.19	872.29 N	612.63 W	736.31	11.20
6898.00	71.99	275.33	6596.83	877.47 N	657.34 W	781.29	10.74
6945.00	76.44	273.28	6609.61	880.85 N	702.42 W	826.38	10.36
7015.00	81.73	267.45	6622.87	881.25 N	771.10 W	894.34	11.14
7073.00	85.43	265.83	6637.93	887.33 N	825.93 W	927.33	8.74

7150.00	85.43	267.28	6637.96	875.08 N	905.09 W	1025.89	2.74
7243.00	85.77	267.49	6645.09	870.84 N	997.72 W	1116.84	0.43
7335.00	88.33	269.07	6649.82	868.09 N	1089.54 W	1207.22	3.27
7428.00	89.32	268.74	6651.73	866.31 N	1182.51 W	1298.87	1.12
7520.00	93.02	271.43	6649.85	866.45 N	1274.46 W	1389.81	4.97
7612.00	93.15	271.34	6644.90	868.66 N	1366.30 W	1480.95	0.17
7703.00	91.60	272.52	6641.13	871.72 N	1457.17 W	1571.25	2.13
7798.00	86.64	271.59	6642.59	875.12 N	1552.07 W	1665.59	5.32
7893.00	88.28	271.15	6646.81	877.39 N	1646.94 W	1759.73	1.79
7988.00	89.26	270.69	6648.85	878.91 N	1741.91 W	1853.85	1.14
8083.00	90.89	269.54	6648.72	879.10 N	1836.90 W	1947.81	2.10
8177.00	89.66	268.73	6648.27	877.68 N	1930.89 W	2040.52	1.57
8272.00	89.85	264.37	6648.68	871.96 N	2025.69 W	2133.40	4.58
8367.00	90.80	264.35	6648.14	862.63 N	2120.23 W	2225.48	1.01
8462.00	92.31	266.45	6645.55	855.01 N	2214.88 W	2317.92	2.72
8557.00	92.10	268.22	6641.90	850.59 N	2309.70 W	2411.01	1.88
8652.00	91.20	270.37	6639.16	849.43 N	2404.65 W	2504.71	2.46
8747.00	90.31	271.10	6637.91	850.65 N	2499.63 W	2598.81	1.21
8842.00	89.81	271.43	6637.81	852.75 N	2594.61 W	2693.03	0.62
8937.00	89.48	271.67	6638.39	855.32 N	2689.57 W	2787.31	0.44
9032.00	89.57	271.12	6639.19	857.63 N	2784.54 W	2881.55	0.59
9127.00	88.61	270.80	6640.69	859.22 N	2879.51 W	2975.69	1.06
9222.00	89.57	270.58	6642.20	860.36 N	2974.49 W	3069.77	1.03
9317.00	88.71	270.82	6643.63	861.53 N	3069.47 W	3163.86	0.94
9411.00	89.23	269.94	6645.33	862.15 N	3163.45 W	3256.87	1.10
9506.00	90.77	271.87	6645.33	863.65 N	3258.43 W	3351.01	2.60
9601.00	89.72	270.97	6644.92	866.00 N	3353.40 W	3445.26	1.46
9696.00	89.48	270.31	6645.58	867.05 N	3448.39 W	3539.34	0.74
9791.00	89.35	270.18	6646.55	867.45 N	3543.39 W	3633.32	0.19
9886.00	90.09	271.10	6647.01	868.51 N	3638.38 W	3727.40	1.25
9981.00	88.86	270.17	6647.88	869.57 N	3733.37 W	3821.47	1.63
10076.00	89.60	270.99	6649.16	870.53 N	3828.35 W	3915.53	1.16
10171.00	89.44	268.27	6649.96	869.92 N	3923.34 W	4009.36	2.87
10266.00	90.28	268.86	6650.19	867.54 N	4018.31 W	4102.90	1.07
10360.00	89.48	268.86	6650.39	865.67 N	4112.29 W	4195.54	0.85
10456.00	88.49	269.01	6652.09	863.89 N	4208.25 W	4290.16	1.04
10550.00	87.19	269.43	6655.63	862.61 N	4302.18 W	4382.83	1.45
10645.00	87.65	268.85	6659.91	861.18 N	4397.07 W	4476.44	0.78
10740.00	89.01	267.60	6662.67	858.24 N	4491.98 W	4569.84	1.94
10835.00	90.99	267.88	6662.67	854.49 N	4586.90 W	4663.13	2.10
10930.00	91.14	269.29	6660.90	852.15 N	4681.85 W	4756.66	1.50
11025.00	90.09	271.13	6659.88	852.50 N	4776.84 W	4850.63	2.23
11120.00	87.84	271.18	6661.60	854.41 N	4871.80 W	4944.81	2.37
11215.00	88.70	271.08	6664.46	856.28 N	4966.74 W	5038.95	0.91
11310.00	89.32	270.36	6666.10	857.47 N	5061.71 W	5133.04	1.00
11405.00	90.22	270.44	6666.48	858.13 N	5156.71 W	5227.06	0.95
11499.00	91.08	271.43	6665.41	859.66 N	5250.69 W	5320.21	1.39
11560.00	91.08	271.43	6664.26	861.18 N	5311.66 W	5380.73	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 DIRECTION OF 278.61 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.67 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11560.00 FEET  
IS 5381.02 FEET ALONG 279.21 DEGREES (GRID)**