



WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	13-Jun-13	14-Jun-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)	662.96	5,835.07			
Log End Depth (TVD, ft)	5,835.07	6,613.82			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	12-Jun-13 13:00	13-Jun-13 22:45			
Drill/Wipe End Date and Time	13-Jun-13 10:30	14-Jun-13 16:00			
Min Inc (deg) @ Depth (TVD, ft)	.45 @ 716.96	2.09 @ 5,838.07			
Max Inc (deg) @ Depth (TVD, ft)	17.68 @ 3,874.51	78.01 @ 6,603.36			
Bit TFA(in2) / Bit Type	.86 / PDC	.86 / PDC			
Flow Rate (gpm)	597.20	555.65			
Max AV (fpm) / CV (fpm) @ MWD	414.4 / NA	385.7 / NA			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.70 / 27.00	11.00 / 34.00			
Filtrate CL (ppm)	2,300.00	2,300.00			
pH / Fluid Loss (mptm)	8.30 / 28	9.80 / 8			
PV (cP) / YP (lbf2)	3 / 2.00	11 / 13.00			
% Solids / % Sand	1.9 / 0.30	12.70 / 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 (in F) / S	170.70 / PDM	170.70 / PDM			

Max Tool Temp (degF) / Source	172.78 / PCM	172.78 / PCM			
Rm @ Max Tool Temp (degF)	NA @ NA	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	11342299	11342299			
Insert Serial Number	11620299	11620299			
Date and Time Initialized	11-Jun-13 18:55	11-Jun-13 18:55			
Date and Time Read	15-Jun-13 02:17	15-Jun-13 02:23			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	58.00	56.00			
Software Version	6.21	6.21			
Sub Serial Number	11342299	11342299			
Sonde Serial Number	11297588	11297588			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	247.57	234.64			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	51.40	49.09			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11342299	11342299			
Insert/Sonde Serial Number	11293433	11293433			

## 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. 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.

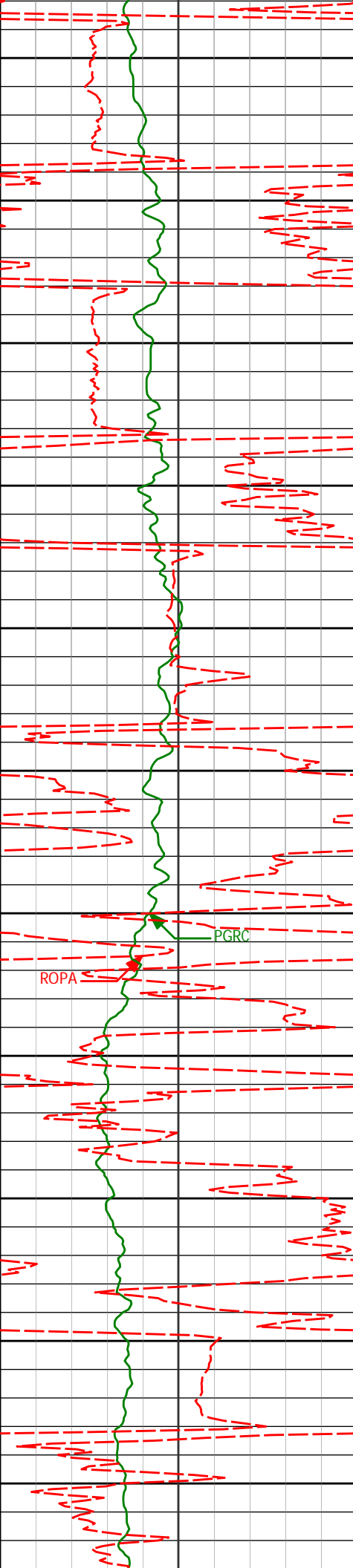
## HALLIBURTON

Sperry Drilling Services

### TVD Main Log 1:600

Noble Energy  
Wells Ranch PC USX AA23-69-1HN  
H&P 343  
T6N-R63W





3300

3360'

11.45°

321.02°

3321.96'

250.21'

3350

3400

3455'

11.71°

328.31°

3415.03'

263.12'

3450

3500

3550'

14.12°

329.49°

3507.62'

276.33'

3550

3600

3645'

14.82°

328.50°

3599.61'

291.08'

3650

3700

3740'

14.21°

330.89°

3691.57'

305.66'

3750

3800

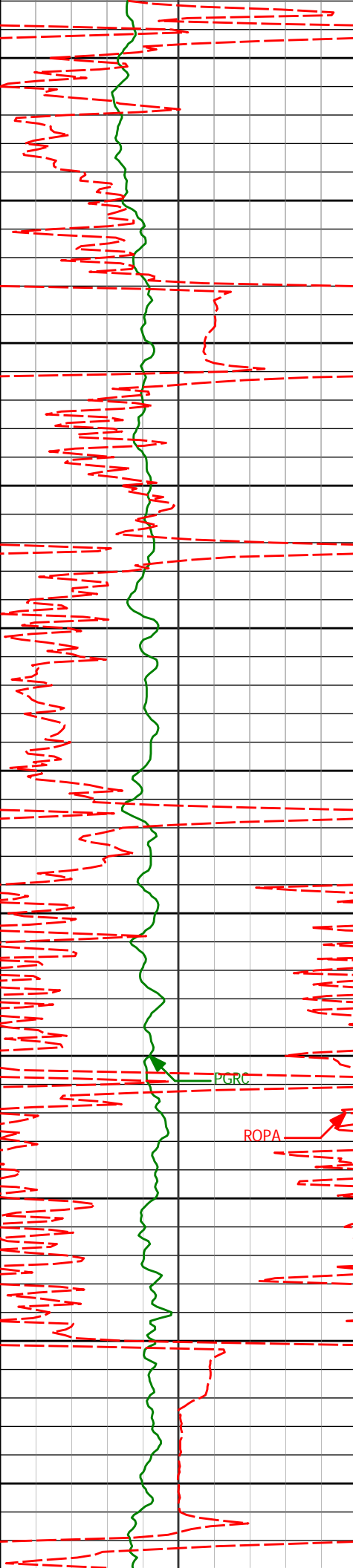
3835'

15.36°

322.88°

3783.44'

321.43'



3850

3930'

17.68°

320.62°

3874.51'

340.77'

3900

3950

4025'

15.74°

320.38°

3965.49'

360.72'

4000

4050

4120'

15.00°

318.38°

4057.09'

379.44'

4100

4150

4215'

12.51°

317.03°

4149.36'

396.65'

4200

PGRC

ROPA

4250

4310'

9.44°

317.95°

4242.61'

410.50'

4300

4350

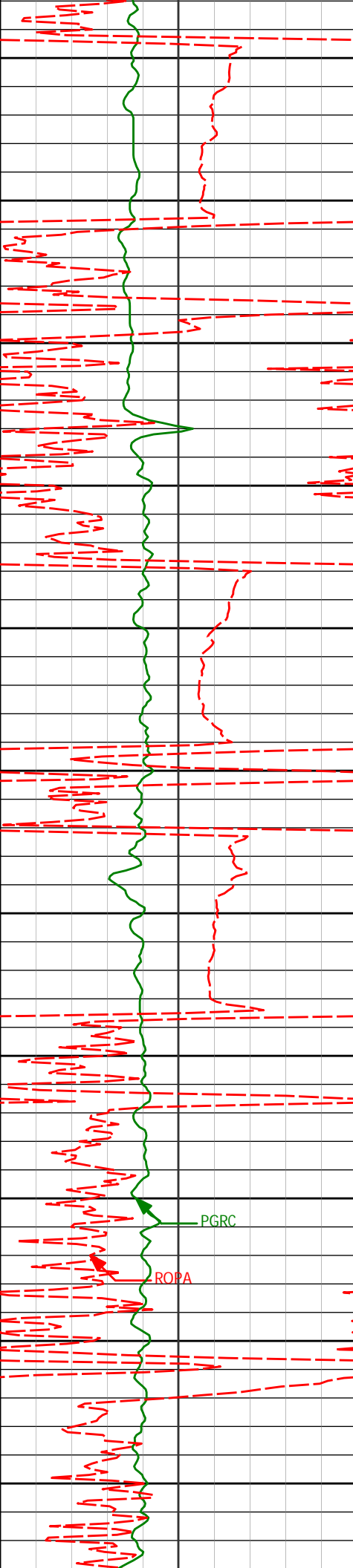
4405'

9.91°

322.32°

4336.26'

422.22'



4400

4500'

13.33°

322.28°

4429.30'

435.77'

4450

4500

4595'

12.12°

320.07°

4521.97'

450.87'

4550

4600

4690'

11.88°

320.93°

4614.89'

465.30'

4650

4700

4785'

14.15°

320.92°

4707.44'

480.81'

4750

4800

4880'

11.75°

317.18°

4800.02'

496.68'

PGRC

ROPA

4850

4900

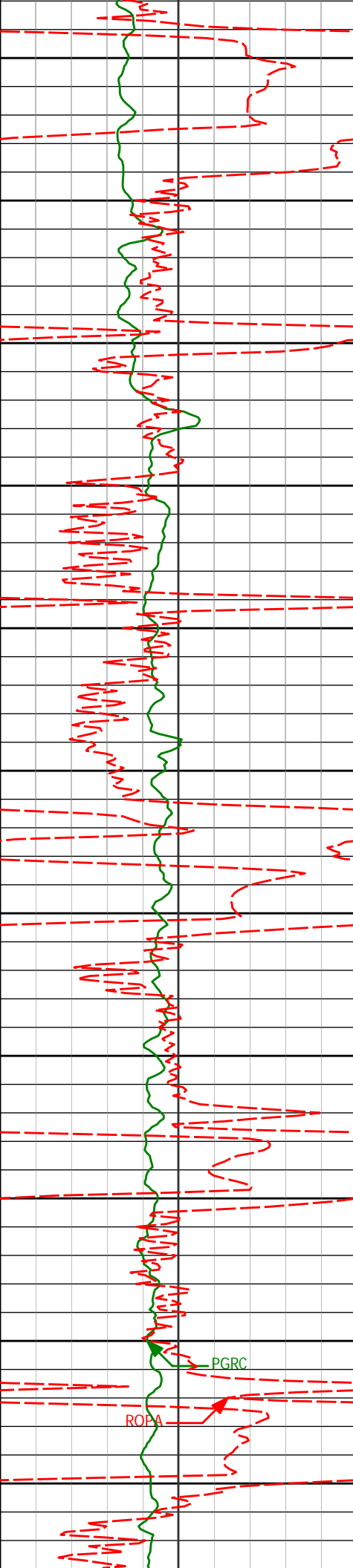
4975'

8.60°

313.82°

4893.52'

509.83'



4950

5070'

7.90°

323.78°

4987.54'

520.06'

5000

5050

5165'

6.31°

328.96°

5081.81'

527.81'

5100

5150

5260'

4.00°

337.06°

5176.42'

532.74'

5200

5250

5355'

2.71°

335.69°

5271.25'

535.60'

5300

5350

5450'

1.08°

356.88°

5366.20'

536.94'

5400

ROPA

PGRC

5450

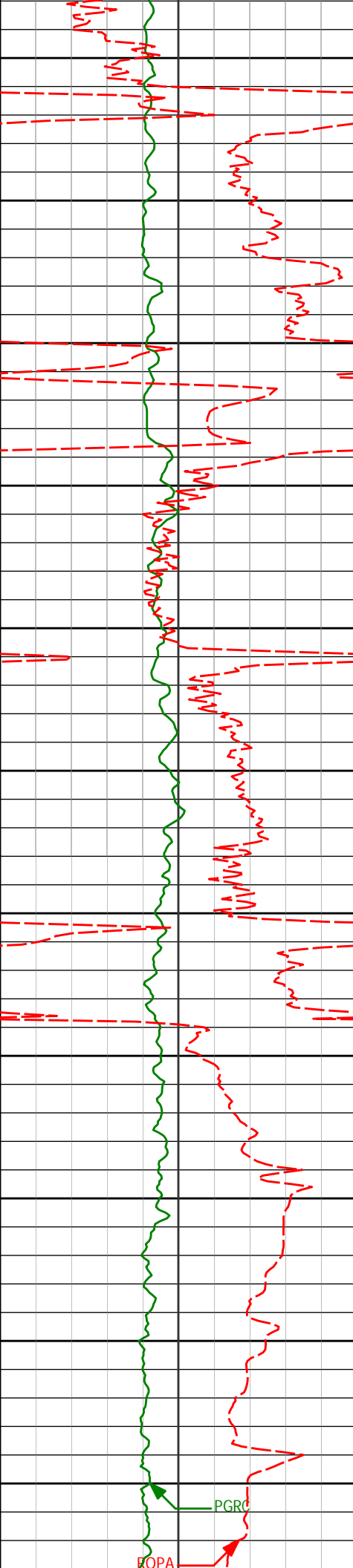
5545'

1.16°

48.40°

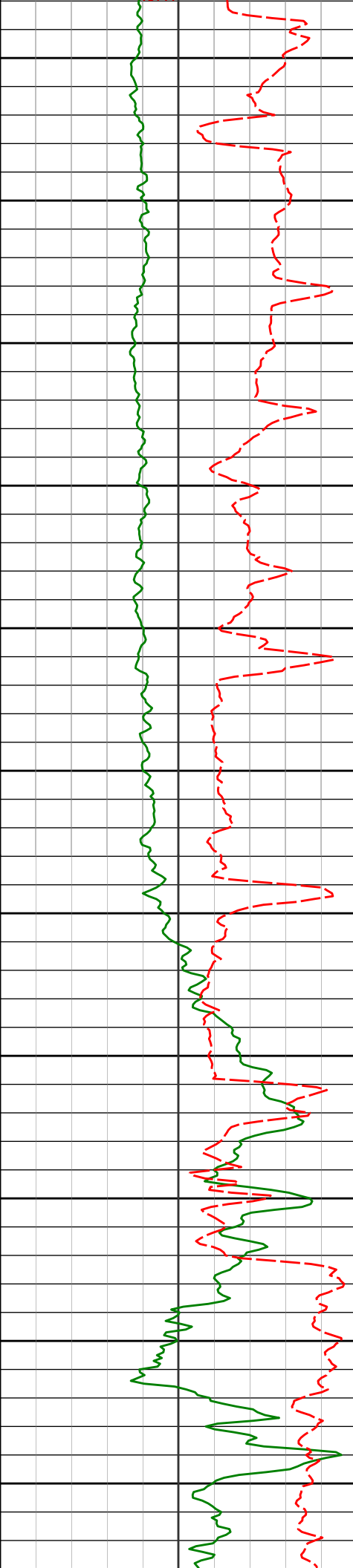
5461.18'

536.47'

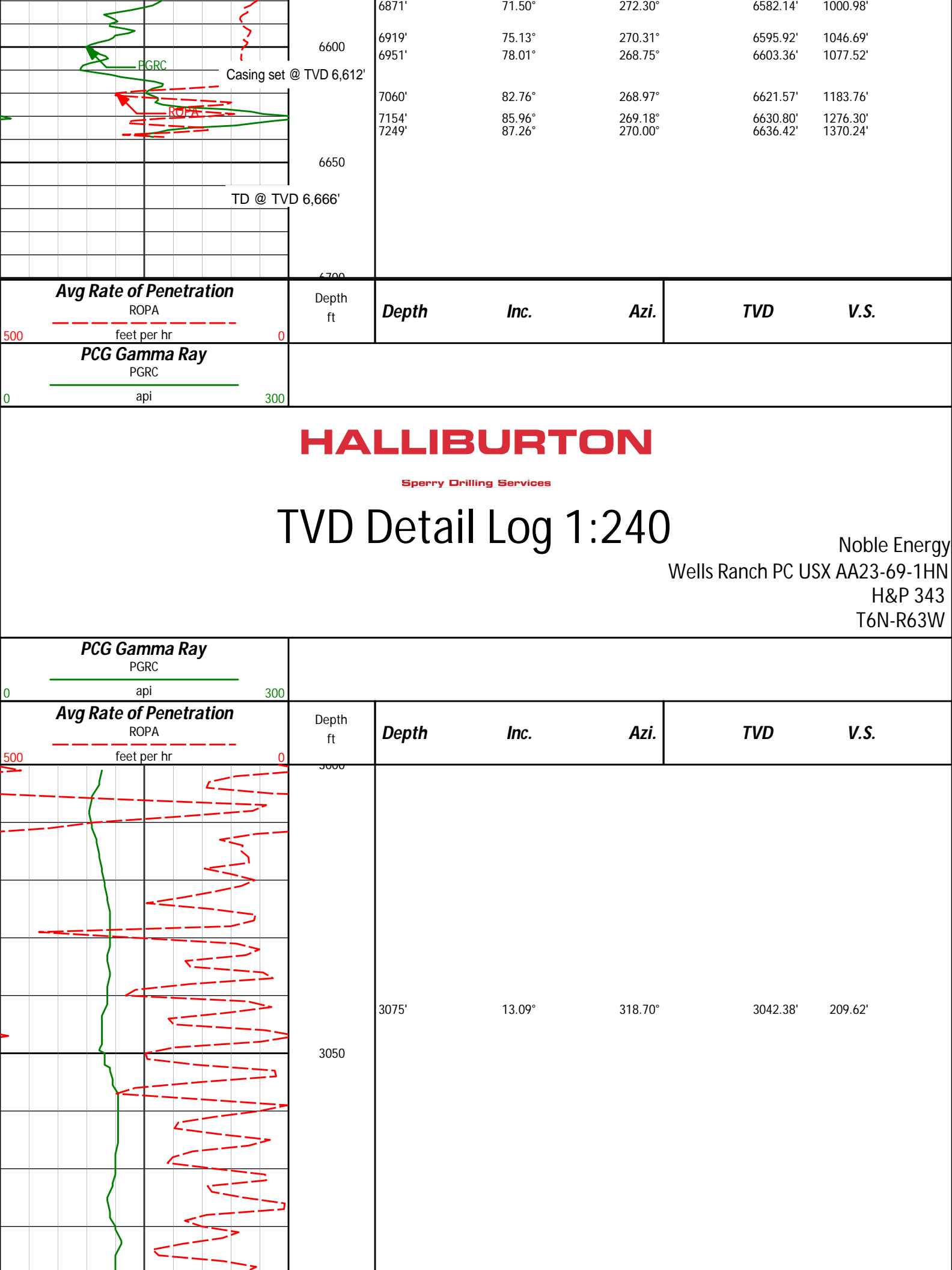


5500				
5550	5640'	1.72°	67.03°	5556.15' 534.62'
5600				
5650	5735'	0.79°	169.71°	5651.14' 533.19'
5700				
5750				
5800				
5850	<Run 200> 5922'	2.09°	122.51°	5838.07' 529.16'
5900				
5950	6017'	2.73°	249.81°	5933.03' 529.60'
6000	6065'	8.06°	259.55°	5980.80' 533.82'
	6112'	11.09°	258.21°	6027.14' 541.22'





6050				
	6160'	14.03°	264.63°	6073.99' 551.26'
6100				
	6207'	17.01°	271.33°	6119.27' 563.65'
6150				
6200				
	6301'	22.73°	279.07°	6207.65' 595.51'
6250				
6300				
	6396'	28.59°	280.54°	6293.25' 636.60'
6350				
6400				
	6491'	39.77°	275.17°	6371.73' 689.84'
6450				
	6539'	47.20°	272.31°	6406.53' 722.77'
	6586'	50.06°	274.97°	6437.60' 757.96'
6500				
	6681'	53.54°	276.17°	6496.34' 832.56'
	6729'	58.20°	277.33°	6523.27' 872.28'
6550				
	6776'	63.65°	276.57°	6546.10' 913.34'
	6824'	67.84°	273.84°	6565.82' 957.05'



6600

6871'

71.50°

272.30°

6582.14'

1000.98'

6919'

75.13°

270.31°

6595.92'

1046.69'

6951'

78.01°

268.75°

6603.36'

1077.52'

7060'

82.76°

268.97°

6621.57'

1183.76'

7154'

85.96°

269.18°

6630.80'

1276.30'

7249'

87.26°

270.00°

6636.42'

1370.24'

6650

TD @ TVD 6,666'

6700

Avg Rate of Penetration

ROPA

feet per hr

500

0

PCG Gamma Ray

PGRC

api

0

300

Depth  
ft

Depth

Inc.

Azi.

TVD

V.S.

HALLIBURTON

Sperry Drilling Services

TVD Detail Log 1:240

Noble Energy

Wells Ranch PC USX AA23-69-1HN

H&P 343

T6N-R63W

PCG Gamma Ray

PGRC

api

0

300

Avg Rate of Penetration

ROPA

feet per hr

500

0

Depth  
ft

Depth

Inc.

Azi.

TVD

V.S.

3050

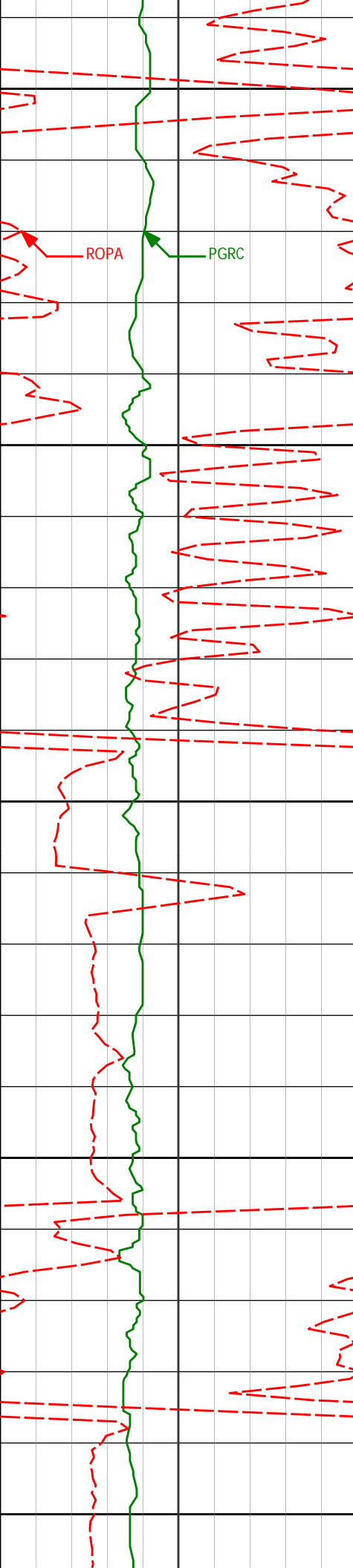
3075'

13.09°

318.70°

3042.38'

209.62'



3100

3150

3200

3250

3300

3170'

11.87°

319.37°

3135.14'

224.97'

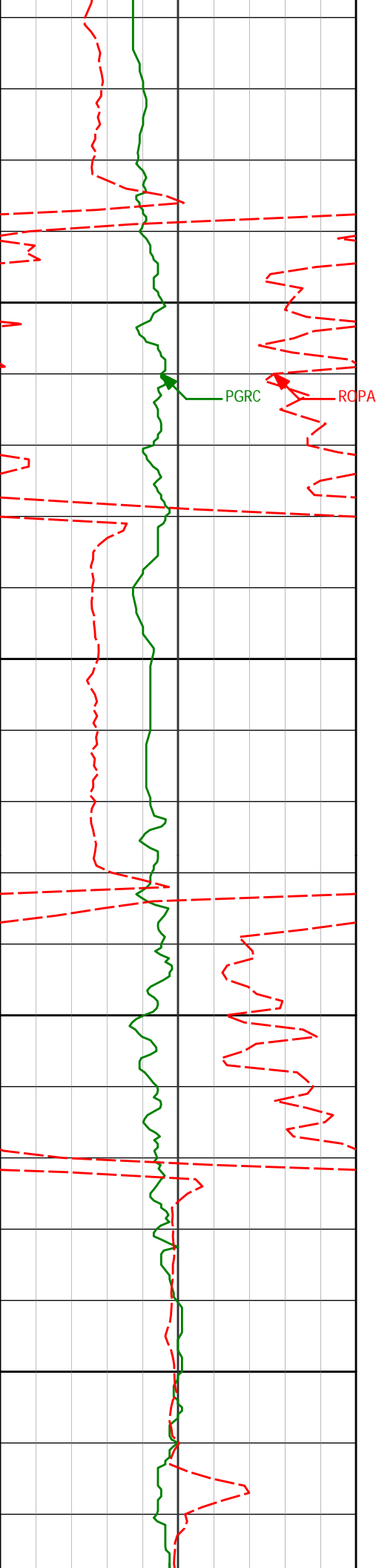
3265'

9.28°

320.73°

3228.52'

237.81'



3360'

11.45°

321.02°

3321.96'

250.21'

3350

PGRC

RCIPA

3400

3455'

11.71°

328.31°

3415.03'

263.12'

3450

3500

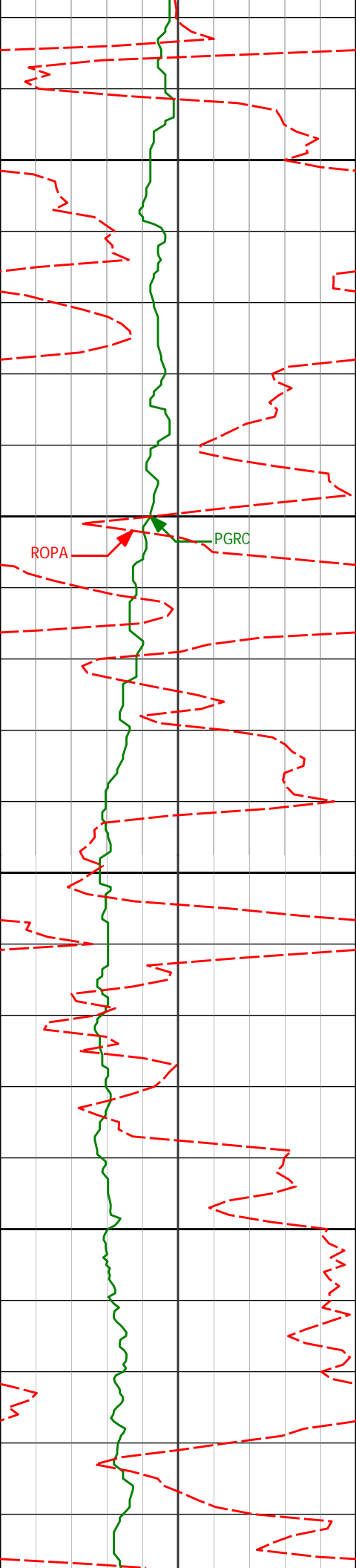
3550'

14.12°

329.49°

3507.62'

276.33'



3550

3600

3650

3700

3645'

14.82°

328.50°

3599.61'

291.08'

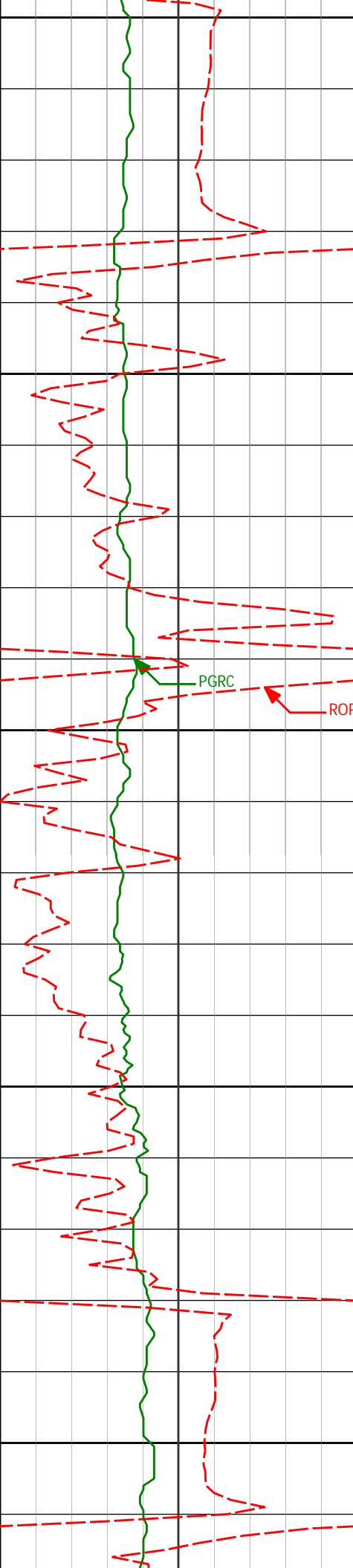
3740'

14.21°

330.89°

3691.57'

305.66'



3750

3835'

15.36°

322.88°

3783.44'

321.43'

3800

3850

3930'

17.68°

320.62°

3874.51'

340.77'

3900

3950

4025'

15.74°

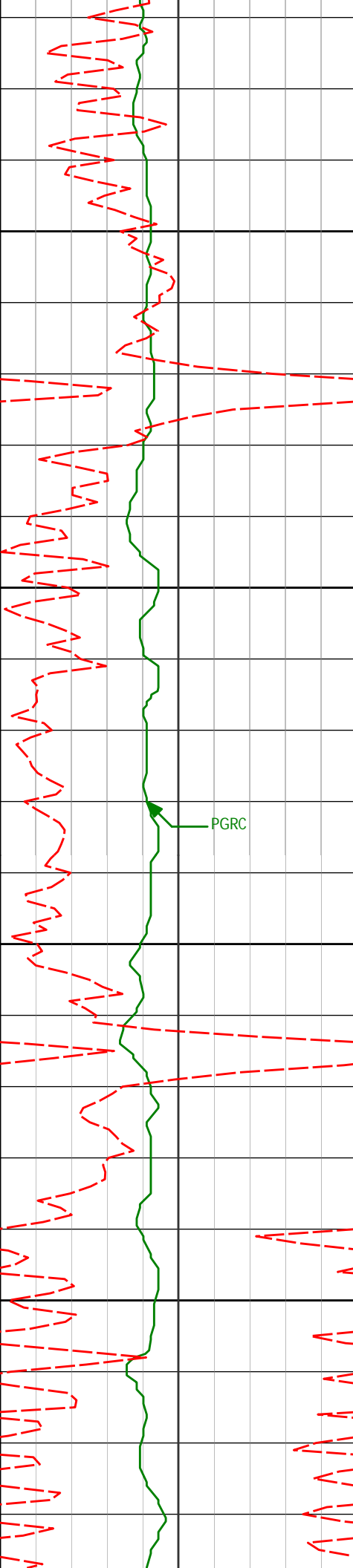
320.38°

3965.49'

360.72'

PGRC

ROFA



4000

4050

4100

4150

PGRC

4120'

15.00°

318.38°

4057.09'

379.44'

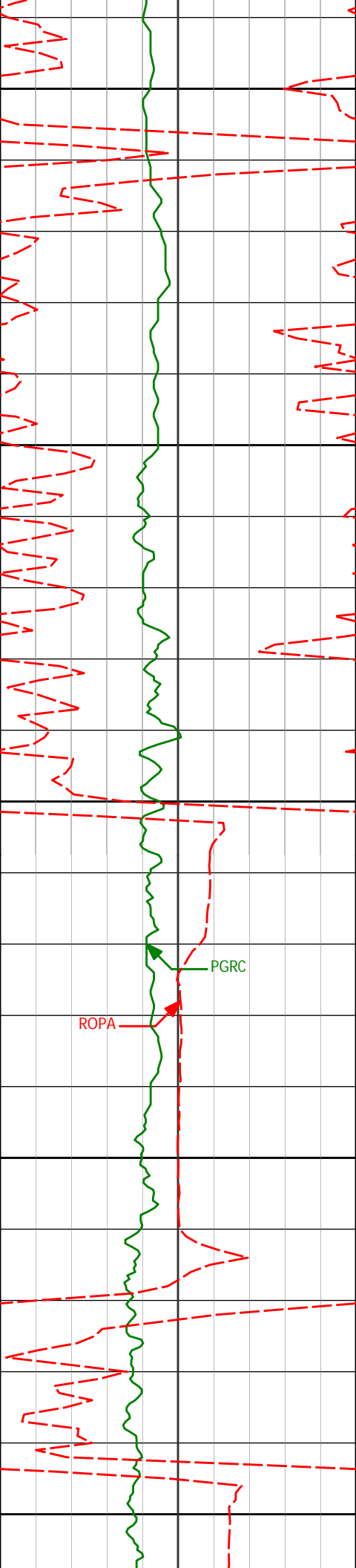
4215'

12.51°

317.03°

4149.36'

396.65'



4200

4310'

9.44°

317.95°

4242.61'

410.50'

4250

4300

PGRC

ROPA

4405'

9.91°

322.32°

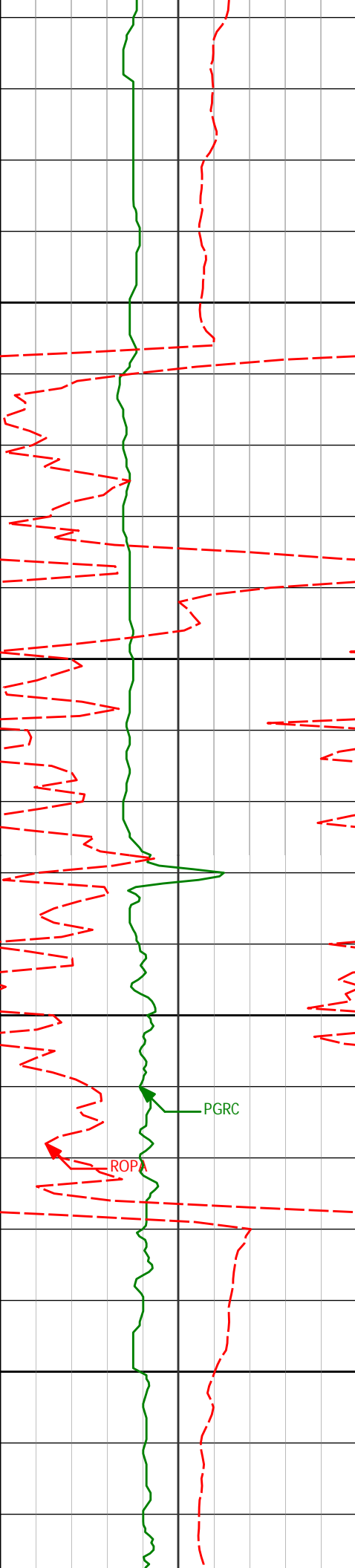
4336.26'

422.22'

4350

4400





4500'	13.33°	322.28°	4429.30'	435.77'
-------	--------	---------	----------	---------

4450

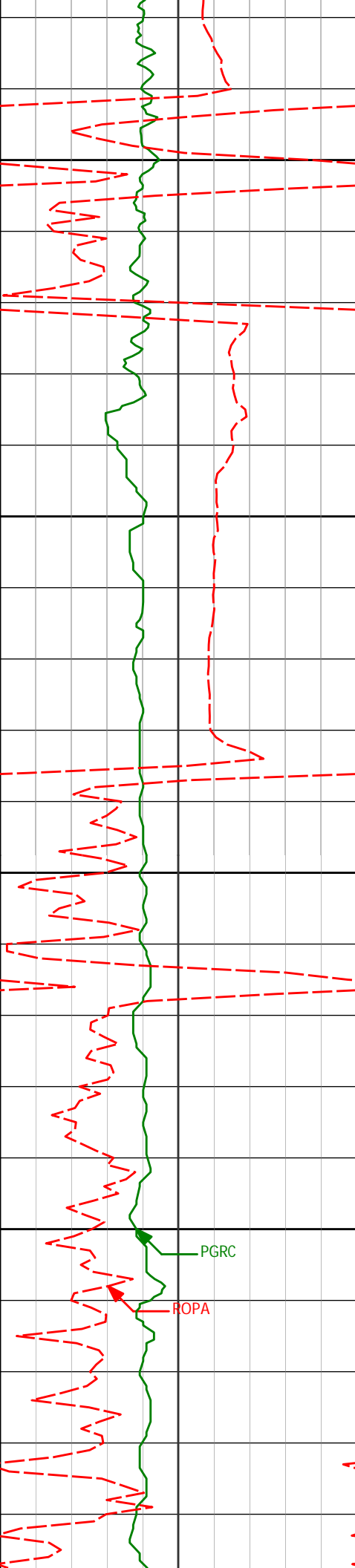
4500

4595'	12.12°	320.07°	4521.97'	450.87'
-------	--------	---------	----------	---------

4550

4600

4690'	11.88°	320.93°	4614.89'	465.30'
-------	--------	---------	----------	---------



4650

4700

4750

4800

4785'

14.15°

320.92°

4707.44'

480.81'

4880'

11.75°

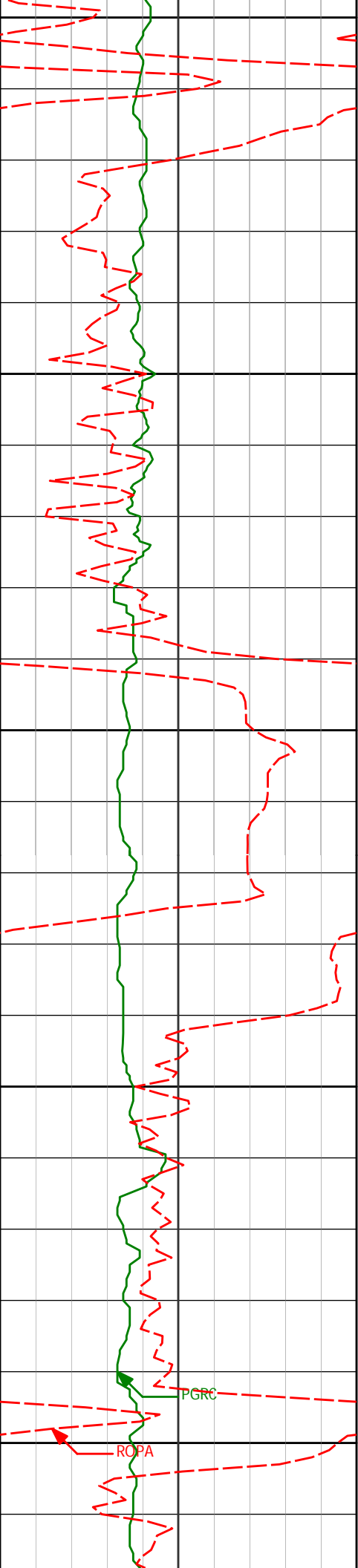
317.18°

4800.02'

496.68'

PGRC

ROPA



4850

4975'

8.60°

313.82°

4893.52'

509.83'

4900

4950

5070'

7.90°

323.78°

4987.54'

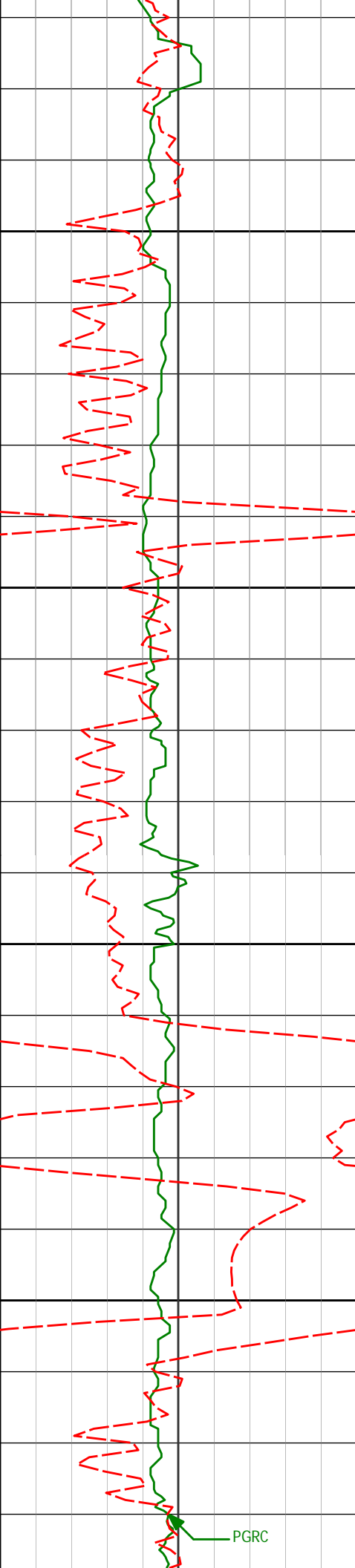
520.06'

5000

5050

PGRC

ROPA



5165'

6.31°

328.96°

5081.81'

527.81'

5100

5150

5260'

4.00°

337.06°

5176.42'

532.74'

5200

5250

5355'

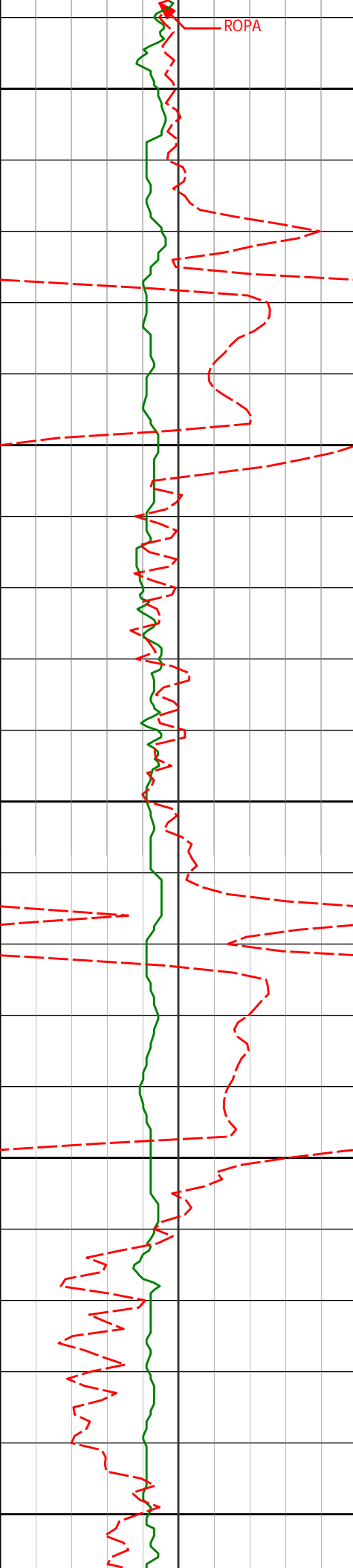
2.71°

335.69°

5271.25'

535.60'

PGRC



5300

5350

5400

5450

5500

5450'

1.08°

356.88°

5366.20'

536.94'

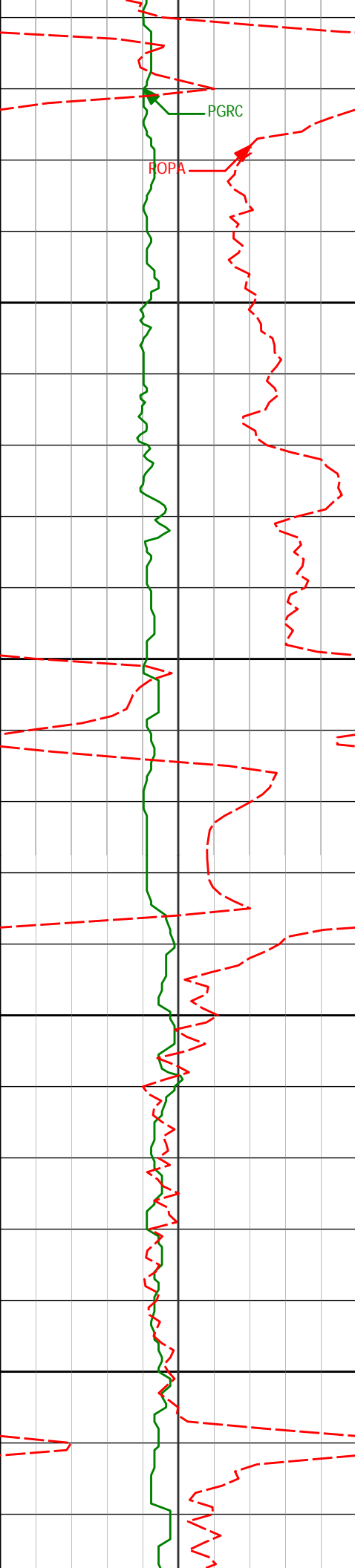
5545'

1.16°

48.40°

5461.18'

536.47'



5550

5640'

1.72°

67.03°

5556.15'

534.62'

5600

5650

5735'

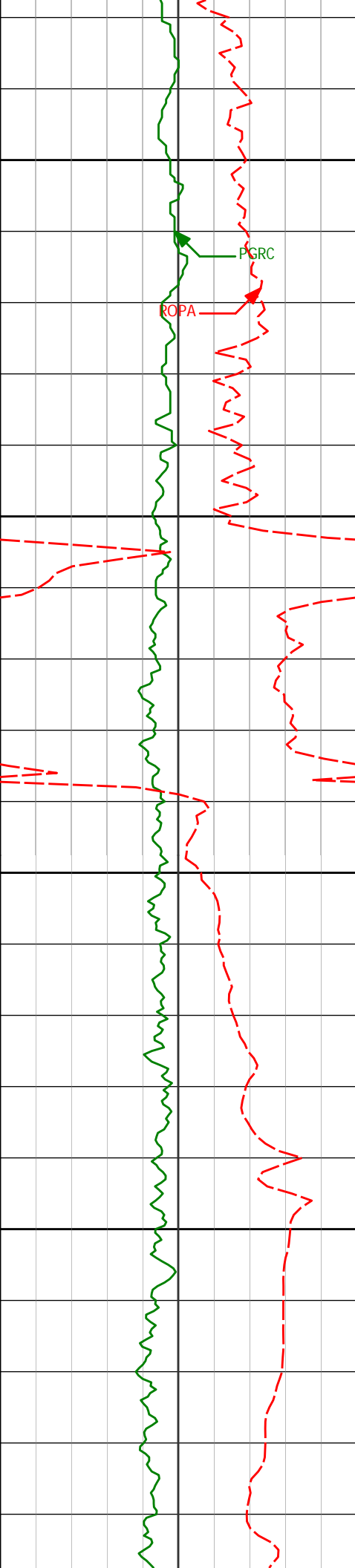
0.79°

169.71°

5651.14'

533.19'

5700



5750

5800

<Run 200>

5850

5900

5922'

2.09°

122.51°

5838.07'

529.16'

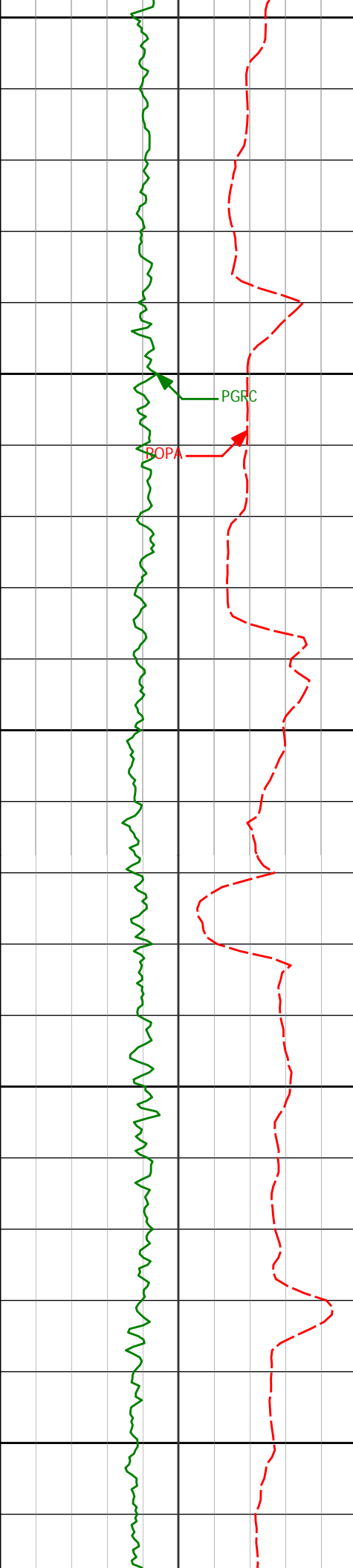
6017'

2.73°

249.81°

5933.03'

529.60'



5950

6065'

8.06°

259.55°

5980.80'

533.82'

6000

6112'

11.09°

258.21°

6027.14'

541.22'

6050

6160'

14.03°

264.63°

6073.99'

551.26'

6100

6207'

17.01°

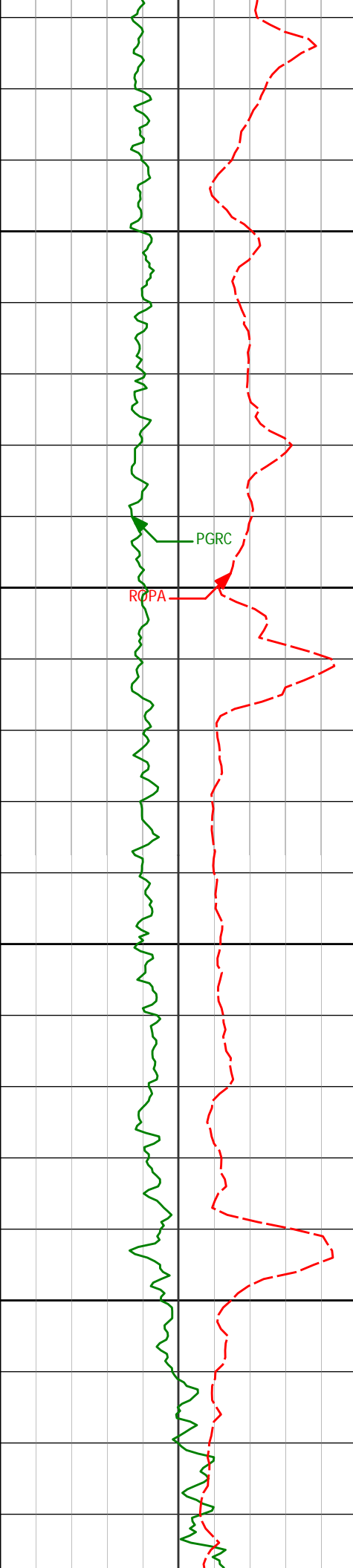
271.33°

6119.27'

563.65'

6150





6200

6301'

22.73°

279.07°

6207.65'

595.51'

6250

PGRC

RCPA

6300

6396'

28.59°

280.54°

6293.25'

636.60'

6350

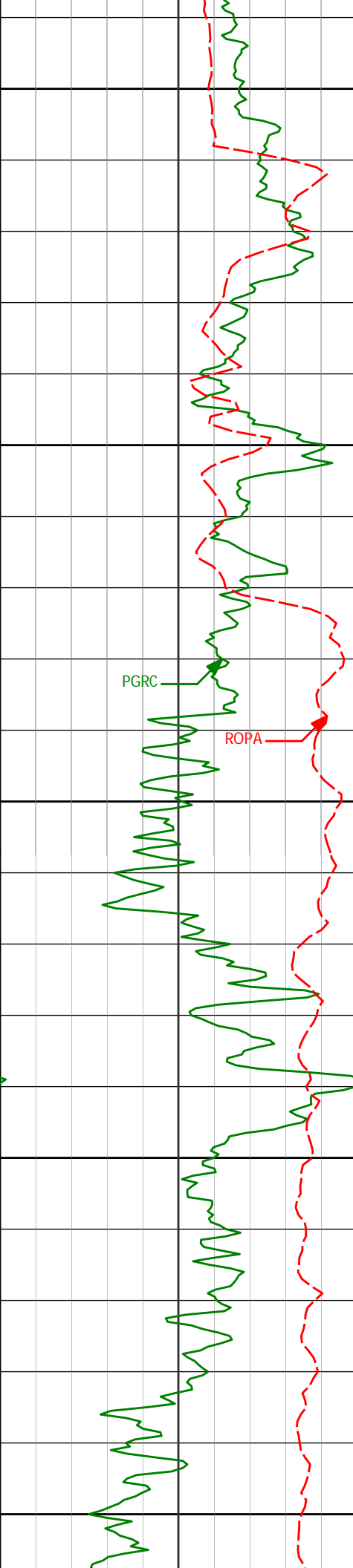
6491'

39.77°

275.17°

6371.73'

689.84'



6400

6539'	47.20°	272.31°	6406.53'	722.77'
-------	--------	---------	----------	---------

6586'	50.06°	274.97°	6437.60'	757.96'
-------	--------	---------	----------	---------

6450

PGRC

ROPA

6500

6681'	53.54°	276.17°	6496.34'	832.56'
-------	--------	---------	----------	---------

6729'	58.20°	277.33°	6523.27'	872.28'
-------	--------	---------	----------	---------

6550

6776'	63.65°	276.57°	6546.10'	913.34'
-------	--------	---------	----------	---------

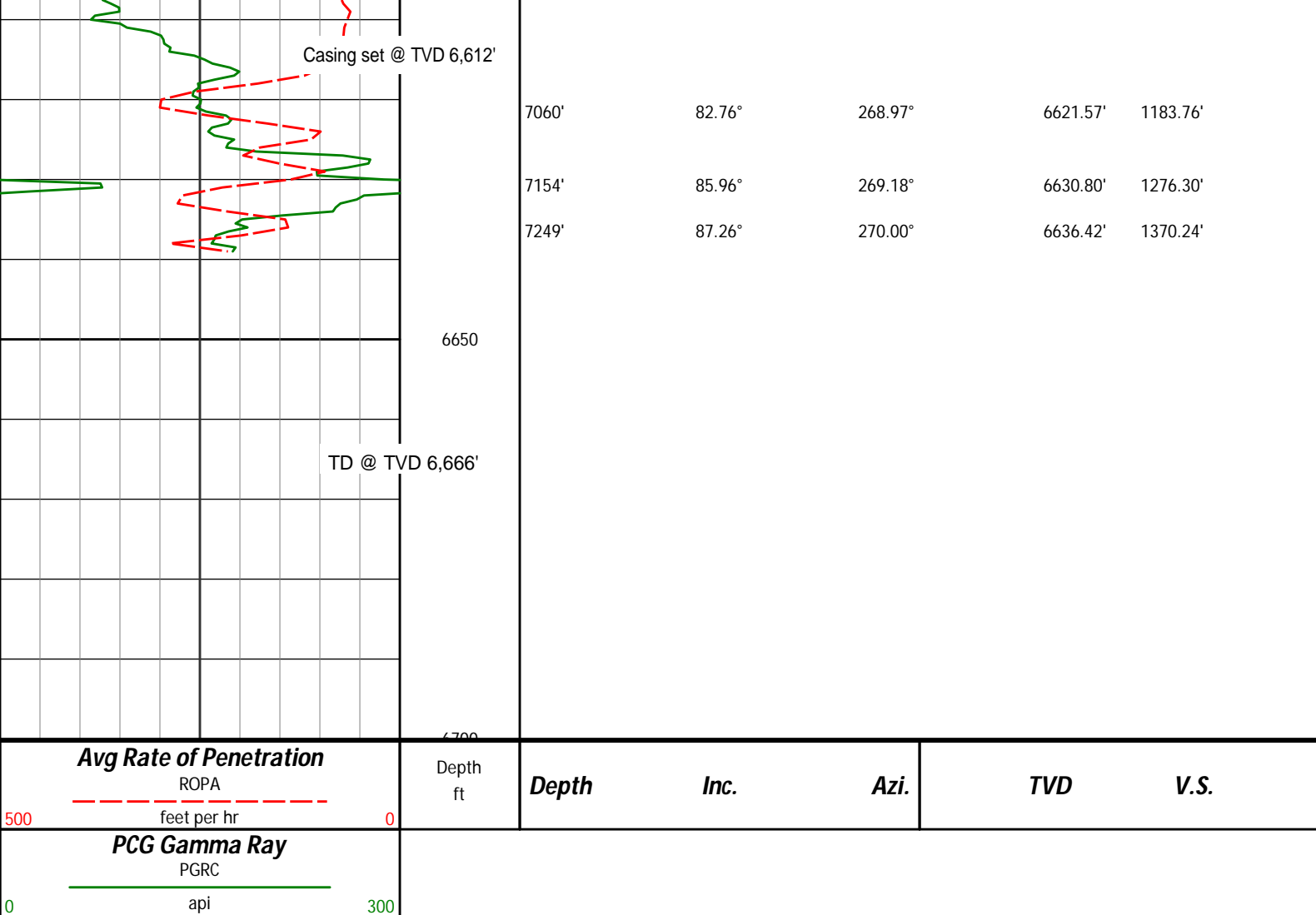
6824'	67.84°	273.84°	6565.82'	957.05'
-------	--------	---------	----------	---------

6871'	71.50°	272.30°	6582.14'	1000.98'
-------	--------	---------	----------	----------

6600

6919'	75.13°	270.31°	6595.92'	1046.69'
-------	--------	---------	----------	----------

6951'	78.01°	268.75°	6603.36'	1077.52'
-------	--------	---------	----------	----------



## HALLIBURTON

### DIRECTIONAL SURVEY REPORT

Noble Energy  
Wells Ranch PC USX AA23-69-1HN  
Wattenburg  
Weld County Colorado  
USA  
CA-XX-0900481586

Surveys are tied into two non-Halliburton surveys at 379' and 660' MD, taken while drilling the surface hole. Final survey is a straight-line projection to bit.

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
379.00	0.80	262.51	378.99	0.34 S	2.62 W	2.56	0.21
660.00	0.80	262.51	659.96	0.86 S	6.51 W	6.35	0.00
717.00	0.45	137.68	716.96	1.07 S	6.76 W	6.56	1.96
904.00	0.50	126.75	903.95	2.10 S	5.61 W	5.30	0.05
1088.00	0.82	122.41	1087.94	3.28 S	3.87 W	3.41	0.18
1181.00	0.75	142.19	1180.93	4.12 S	2.93 W	2.38	0.30
1274.00	0.81	125.42	1273.92	4.98 S	2.03 W	1.37	0.25
1368.00	0.84	135.38	1367.91	5.85 S	1.00 W	0.24	0.16
1460.00	0.85	143.53	1459.90	6.88 S	0.12 W	-0.77	0.13
1555.00	1.76	359.57	1554.89	5.99 S	0.29 E	-1.06	2.63
1650.00	4.37	340.07	1649.75	1.12 S	0.96 W	0.80	2.92
1745.00	7.03	322.41	1744.28	6.89 N	5.74 W	6.58	3.32
1840.00	8.74	319.11	1838.38	16.95 N	14.01 W	16.08	1.87
1935.00	10.86	319.27	1931.98	29.19 N	24.58 W	28.14	2.23

	2030.00	12.73	318.11	2024.97	43.77 N	37.41 W	42.75	1.98
	2125.00	12.87	322.77	2117.61	59.99 N	50.81 W	58.13	1.10
	2220.00	14.49	324.68	2209.91	78.12 N	64.08 W	73.63	1.77
	2315.00	13.85	324.09	2302.02	97.03 N	77.62 W	89.50	0.69
	2410.00	12.06	324.35	2394.60	114.31 N	90.08 W	104.09	1.88
	2505.00	12.63	325.03	2487.40	130.88 N	101.82 W	117.87	0.62
	2600.00	14.31	325.49	2579.79	149.07 N	114.42 W	132.72	1.77
	2695.00	13.27	324.80	2672.05	167.65 N	127.36 W	147.94	1.10
	2790.00	12.14	323.85	2764.72	184.62 N	139.53 W	162.21	1.21
	2885.00	13.31	319.07	2857.39	200.95 N	152.59 W	177.27	1.66
	2980.00	13.16	319.35	2949.86	217.42 N	166.80 W	193.49	0.17
	3075.00	13.09	318.70	3042.38	233.71 N	180.95 W	209.62	0.17
	3170.00	11.87	319.37	3135.14	249.21 N	194.41 W	224.97	1.30
	3265.00	9.28	320.73	3228.52	262.55 N	205.62 W	237.81	2.74
	3360.00	11.45	321.02	3321.96	275.82 N	216.40 W	250.21	2.29
	3455.00	11.71	328.31	3415.03	291.35 N	227.40 W	263.12	1.56
	3550.00	14.12	329.49	3507.62	309.54 N	238.35 W	276.33	2.56
	3645.00	14.82	328.50	3599.61	329.88 N	250.58 W	291.08	0.78
	3740.00	14.21	330.89	3691.57	350.43 N	262.60 W	305.66	0.90
	3835.00	15.36	322.88	3783.44	370.66 N	275.87 W	321.43	2.47
	3930.00	17.68	320.62	3874.51	391.85 N	292.62 W	340.77	2.53
	4025.00	15.74	320.38	3965.49	412.93 N	309.99 W	360.72	2.05
	4120.00	15.00	318.38	4057.09	432.05 N	326.37 W	379.44	0.95
	4215.00	12.51	317.03	4149.36	448.77 N	341.56 W	396.65	2.65
	4310.00	9.44	317.95	4242.61	462.09 N	353.79 W	410.50	3.23
	4405.00	9.91	322.32	4336.26	474.34 N	364.01 W	422.22	0.92
	4500.00	13.33	322.28	4429.30	489.48 N	375.71 W	435.77	3.60
	4595.00	12.12	320.07	4521.97	505.79 N	388.81 W	450.87	1.38
	4690.00	11.88	320.93	4614.89	521.03 N	401.37 W	465.30	0.31
	4785.00	14.15	320.92	4707.44	537.64 N	414.86 W	480.81	2.38
	4880.00	11.75	317.18	4800.02	553.75 N	428.76 W	496.68	2.67
	4975.00	8.60	313.82	4893.52	565.77 N	440.46 W	509.83	3.38
	5070.00	7.90	323.78	4987.54	575.96 N	449.44 W	520.06	1.67
	5165.00	6.31	328.96	5081.81	585.70 N	455.99 W	527.81	1.81
	5260.00	4.00	337.06	5176.42	593.23 N	459.98 W	532.74	2.54
	5355.00	2.71	335.69	5271.25	598.33 N	462.20 W	535.60	1.36
	5450.00	1.08	356.88	5366.20	601.27 N	463.17 W	536.94	1.84
	5545.00	1.16	48.40	5461.18	602.80 N	462.50 W	536.47	1.03
	5640.00	1.72	67.03	5556.15	604.00 N	460.47 W	534.62	0.76
	5735.00	0.79	169.71	5651.14	603.91 N	459.05 W	533.19	2.15
	5861.00	1.88	123.30	5777.10	601.93 N	457.16 W	531.07	1.15
	5922.00	2.09	122.51	5838.07	600.78 N	455.39 W	529.16	0.34
	6017.00	2.73	249.81	5933.03	599.07 N	456.06 W	529.60	4.55
	6065.00	8.06	259.55	5980.80	598.06 N	460.44 W	533.82	11.23
	6112.00	11.09	258.21	6027.14	596.54 N	468.11 W	541.22	6.46
	6160.00	14.03	264.63	6073.99	595.05 N	478.42 W	551.26	6.78
	6207.00	17.01	271.33	6119.27	594.68 N	490.97 W	563.65	7.39
	6301.00	22.73	279.07	6207.65	597.86 N	522.68 W	595.51	6.69
	6396.00	28.59	280.54	6293.25	604.92 N	563.19 W	636.60	6.21
	6491.00	39.77	275.17	6371.73	611.84 N	615.98 W	689.84	12.18
	6539.00	47.20	272.31	6406.53	613.94 N	648.92 W	722.77	16.00
	6586.00	50.06	274.97	6437.60	616.20 N	684.11 W	757.96	7.42
	6681.00	53.54	276.17	6496.34	623.46 N	758.39 W	832.56	3.79
	6729.00	58.20	277.33	6523.27	628.14 N	797.84 W	872.28	9.92
	6776.00	63.65	276.57	6546.10	633.10 N	838.60 W	913.34	11.67
	6824.00	67.84	273.84	6565.82	637.05 N	882.17 W	957.05	10.16
	6871.00	71.50	272.30	6582.14	639.40 N	926.17 W	1000.98	8.37
	6919.00	75.13	270.31	6595.92	640.44 N	972.12 W	1046.69	8.53
	6951.00	78.01	268.75	6603.36	640.18 N	1003.24 W	1077.52	10.18
	7060.00	82.76	268.97	6621.57	638.04 N	1110.66 W	1183.76	4.36
	7154.00	85.96	269.18	6630.80	636.53 N	1204.18 W	1276.30	3.42
	7249.00	87.26	270.00	6636.42	635.85 N	1299.01 W	1370.24	1.61
	7344.00	88.64	269.75	6639.82	635.65 N	1393.94 W	1464.36	1.48
	7439.00	91.60	268.42	6639.62	634.14 N	1488.92 W	1558.34	3.42
	7534.00	92.00	268.66	6636.63	631.72 N	1583.84 W	1652.16	0.49
	7629.00	90.68	268.54	6634.40	629.40 N	1678.78 W	1746.01	1.40
	7724.00	90.46	268.27	6633.46	626.76 N	1773.74 W	1839.83	0.36
	7819.00	90.46	268.37	6632.69	623.97 N	1868.70 W	1933.63	0.11
	7913.00	90.22	268.14	6632.14	621.11 N	1962.65 W	2026.43	0.36
	8008.00	90.83	267.98	6631.27	617.89 N	2057.59 W	2120.16	0.67
	8103.00	89.88	269.33	6630.68	615.67 N	2152.56 W	2214.05	1.74
	8198.00	90.55	269.68	6630.32	614.84 N	2247.56 W	2308.14	0.80
	8293.00	89.63	270.81	6630.17	615.25 N	2342.55 W	2402.39	1.54
	8387.00	90.86	272.47	6629.76	617.94 N	2436.51 W	2495.91	2.20
	8482.00	88.74	269.76	6630.09	619.79 N	2531.48 W	2590.32	3.63

8577.00	88.80	269.31	6632.14	619.02 N	2626.45 W	2684.40	0.48
8672.00	89.14	269.16	6633.85	617.75 N	2721.43 W	2778.42	0.39
8767.00	89.72	269.22	6634.79	616.41 N	2816.41 W	2872.43	0.62
8862.00	88.92	270.70	6635.92	616.35 N	2911.40 W	2966.62	1.77
8957.00	89.45	270.61	6637.27	617.44 N	3006.39 W	3060.95	0.56
9052.00	87.93	272.42	6639.44	619.95 N	3101.32 W	3155.41	2.48
9147.00	87.62	272.39	6643.13	623.93 N	3196.17 W	3249.98	0.33
9242.00	88.52	273.78	6646.32	629.04 N	3290.97 W	3344.65	1.74
9337.00	88.34	273.65	6648.93	635.19 N	3385.74 W	3439.42	0.24
9432.00	89.35	271.64	6650.85	639.58 N	3480.61 W	3534.06	2.37
9527.00	89.20	271.22	6652.05	641.95 N	3575.57 W	3628.53	0.47
9621.00	89.26	271.51	6653.31	644.19 N	3669.54 W	3722.00	0.31
9716.00	90.06	270.74	6653.88	646.06 N	3764.52 W	3816.43	1.17
9811.00	90.22	270.47	6653.65	647.07 N	3859.51 W	3910.75	0.33
9906.00	90.25	270.64	6653.26	647.99 N	3954.50 W	4005.07	0.17
10001.00	90.06	270.10	6653.01	648.60 N	4049.50 W	4099.35	0.60
10096.00	90.80	269.64	6652.29	648.38 N	4144.50 W	4193.53	0.91
10191.00	90.59	270.40	6651.14	648.42 N	4239.49 W	4287.73	0.83
10286.00	88.21	270.17	6652.14	648.89 N	4334.48 W	4381.98	2.51
10381.00	88.27	270.06	6655.05	649.08 N	4429.43 W	4476.16	0.14
10476.00	87.93	269.88	6658.20	649.03 N	4524.38 W	4570.31	0.40
10571.00	87.16	270.07	6662.26	648.99 N	4619.29 W	4664.42	0.84
10666.00	88.21	270.31	6666.10	649.30 N	4714.21 W	4758.59	1.14
10761.00	88.40	269.70	6668.91	649.30 N	4809.17 W	4852.75	0.66
10856.00	91.17	270.61	6669.27	649.56 N	4904.16 W	4946.98	3.07
10898.00	91.57	271.04	6668.26	650.16 N	4946.14 W	4988.69	1.40
10962.00	91.57	271.04	6666.51	651.32 N	5010.11 W	5052.27	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 277.42 DEGREES (GRID)  
A TOTAL CORRECTION OF 7.71 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10962.00 FEET  
IS 5052.27 FEET ALONG 277.41 DEGREES (GRID)**