



PCG Pressure Case Gamma PCD Pressure Case Directional

Country	: USA
Field	: Wattenburg
Location	: Lat: 40° 28' 34.46" North Long: 104° 23' 36.96" West
Well	: Wells Ranch USX AA23-67HN
Company	: Noble Energy
Rig	: H&P 343
LOCATION	Company : Noble Energy
	Rig : H&P 343
Latitude : 40° 28' 34.46" North Longitude : 104° 23' 36.96" West	Well : Wells Ranch USX AA23-67HN
	Field : Wattenburg
UTM Easting = 3,307,789.550 ft UTM Northing = 1,418,254.770 ft	Country : USA
API Number : 05-123-37172	
Other Services Directional Drilling	

Permanent Datum	: Ground Level	Elevation	: 4793.00 ft	Elev.	KB NA
Log Measured From	: Drill Floor	24.00 ft	Above Permanent Datum	DF 4817.00 ft	GL 4793.00 ft
Drilling Measured From	: Drill Floor			WD NA	NA

Depth Logged	: 673.00 ft	To	6,707.22 ft	Unit No.	: 11610115	Job No.	: CA-XX-0900544014
Date Logged	: 27-Jun-13	To	02-Jul-13	Plot Type	: Final		
Total Depth MD	: 11,155.00 ft	TVD	: 6,707.22 ft	Plot Date	: 03-Jul-13		
Spud Date	: 27-Jun-13						

Run No.	Borehole Record (TVD)		Run No.		Borehole Record (TVD)	
	Size	From	To	Size	From	To
2	8.750 in	673.00 ft	5,891.06 ft			
3	8.750 in	5,891.06 ft	6,663.56 ft			
				Casing Record (TVD)		
				Size	Weight	To
				9.625 in	36.00 lbpf	SURFACE 663.00 ft
				7.000 in	26.00 lbpf	SURFACE 6,662.73 ft

WELL INFORMATION

MWD Run Number	100	200
Date run completed	28-Jun-13	29-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)	673.00	5,891.06
Log End Depth (TVD, ft)	5,891.06	6,663.56
Drill or Wipe	Drill	Drill
Drill/Wipe Start Date and Time	28-Jun-13 00:00	29-Jun-13 00:00
Drill/Wipe End Date and Time	28-Jun-13 15:30	29-Jun-13 16:30
Min Inc (deg) @ Depth (TVD, ft)	0 @ 663.00	8.07 @ 5,984.74
Max Inc (deg) @ Depth (TVD, ft)	13.45 @ 2,303.68	83.86 @ 6,658.31
Bit TFA(in2) / Bit Type	.86 / PDC	.86 / PDC
Flow Rate (gpm)	573.05	515.00
Max AV (fpm) / CV (fpm) @ MWD	300.0 / NA	300.0 / NA
Fluid Type	Fresh Water Gel	Fresh Water Gel
Density (ppg) / Viscosity (spqt)	8.65 / 27.00	10.80 / 13.00
Filtrate CL (ppm)	1,900.00	2,200.00
pH / Fluid Loss (mptm)	9.70 / 50	9.60 / 8
PV (cP) / YP (Ihf2)	6 / 1.00	13 / 12.00
% Solids / % Sand	2.8 / 0.25	4.3 / 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 (degF) / Source	150.10 / PCM	171.10 / 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	27-Jun-13 17:08	01-Jan-70 00:00		
Date and Time Read	29-Jun-13 23:41	29-Jun-13 23:32		
ECMB SW Version	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC		
Distance From Bit (ft)	57.00	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)	80.23	239.64		

Gamma Ray Sensor Information

Tool Type	PCG	PCG		
Distance From Bit (ft)	50.11	49.36		
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 annular 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

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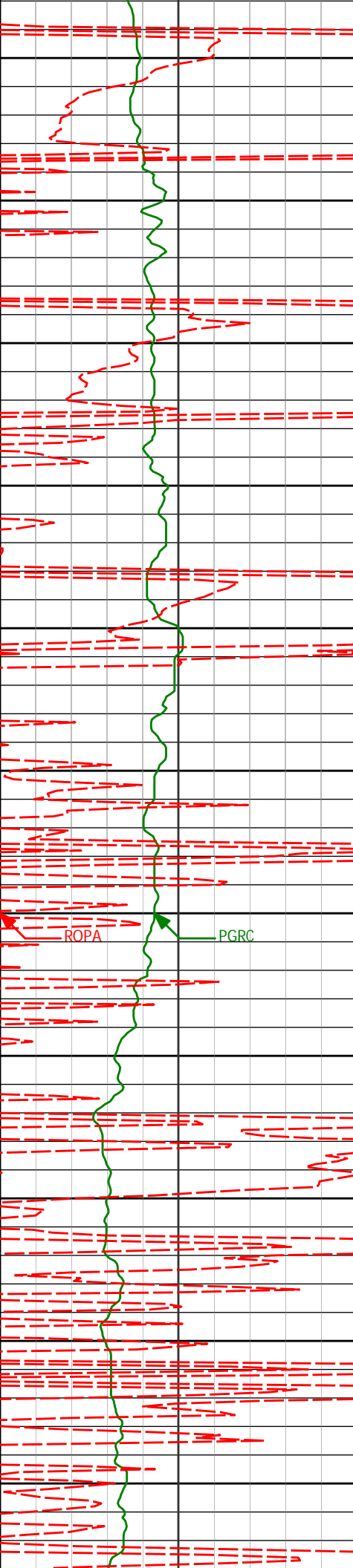
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Sperry Drilling Services

TVD Main Log 1:600

Noble Energy
Wells Ranch USX AA23-67HN
H&P 343
T6N-R63W

PCG Gamma Ray PGRC api					
Avg Rate of Penetration ROPA feet per hr	Depth ft	<i>Depth</i>	<i>Inc.</i>	<i>Azi.</i>	<i>TVD</i>
0					
300					
500	3000				
	3050	3075'	10.58°	229.43°	3047.39' 234.67'
	3100				
	3150	3170'	10.89°	236.39°	3140.73' 249.30'
	3200				
	3250	3265'	7.23°	233.44°	3234.53' 262.02'



3300

3360' 2.98° 250.90° 3329.14' 269.38'

3350

3400

3455' 1.10° 249.95° 3424.07' 272.62'

3450

3500

3550' 2.12° 40.46° 3519.06' 272.29'

3550

3600

ROPA PGRC

3650

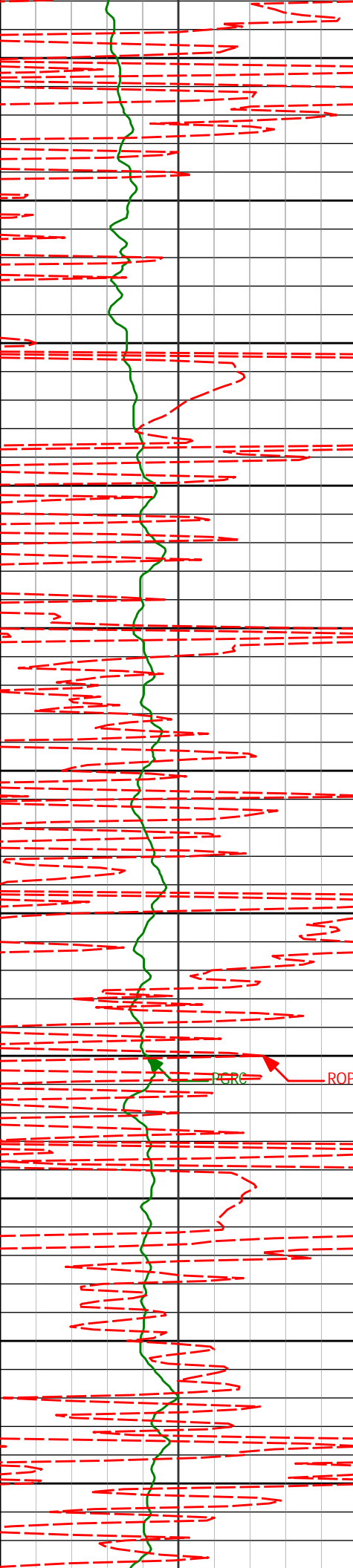
3700

3740' 2.58° 48.24° 3708.90' 266.54'

3750

3800

3835' 3.05° 42.69° 3803.78' 263.07'



3850

3900

3950

4000

4050

4100

4150

4200

4250

4300

4350

3930'

2.66°

41.98°

3898.66'

259.70'

4025'

0.89°

95.24°

3993.62'

257.41'

4120'

1.30°

89.58°

4088.60'

255.60'

4215'

1.79°

110.17°

4183.57'

253.17'

4310'

1.03°

145.43°

4278.54'

251.36'

4405'

1.98°

168.16°

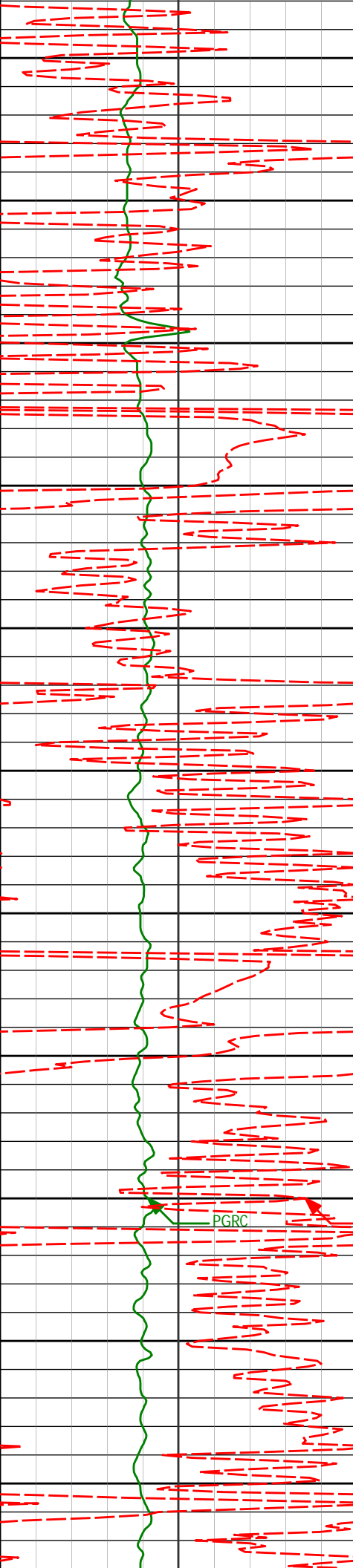
4373.51'

250.66'

PGRC

ROPA





4400

4450

4500'

1.64°

162.88°

4468.46'

250.08'

4500

4550

4595'

1.54°

174.73°

4563.42'

249.70'

4600

4650

4690'

1.24°

149.35°

4658.40'

249.17'

4700

4750

4785'

0.85°

75.11°

4753.38'

248.00'

4800

PGRC

ROPA

4850

4880'

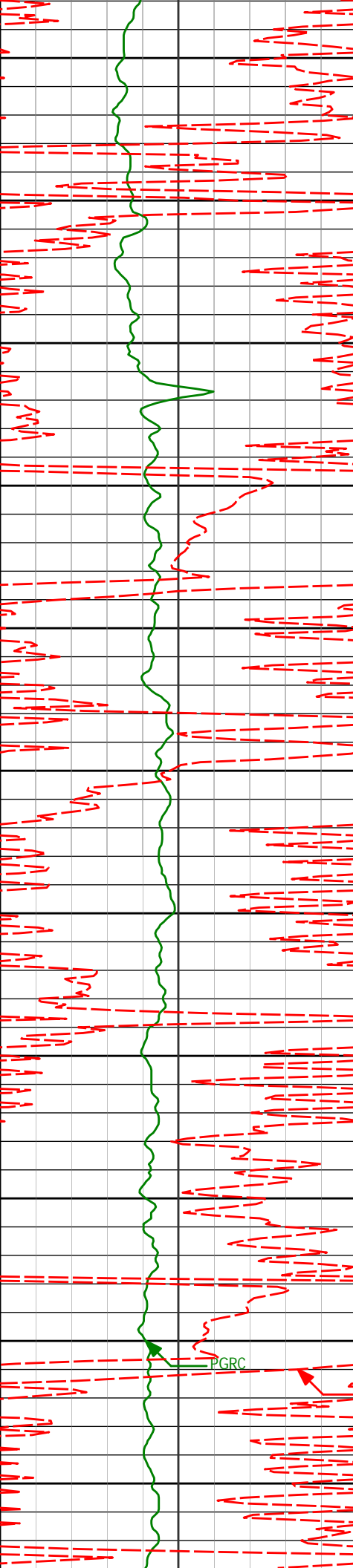
1.75°

106.61°

4848.36'

245.94'

4900

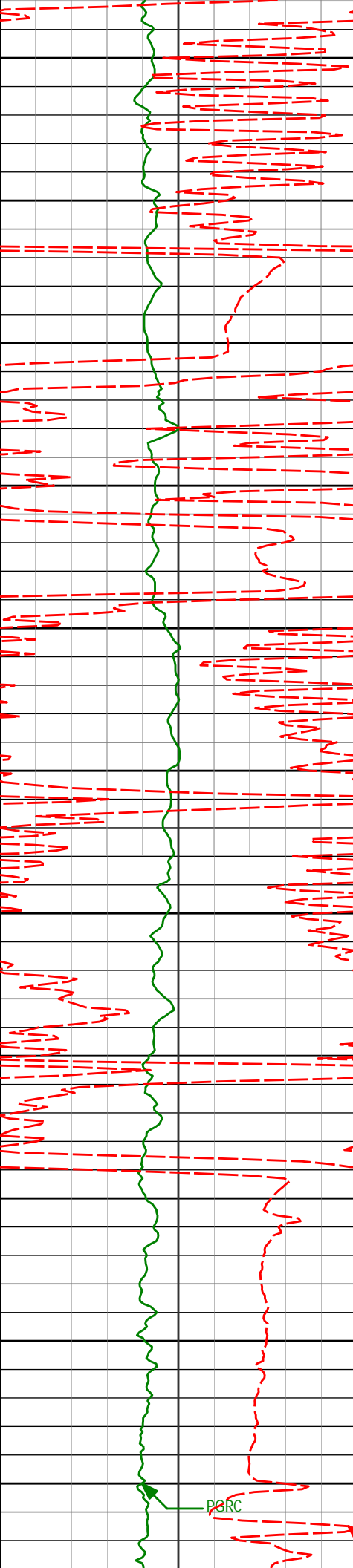


4950
5000
5050
5100
5150
5200
5250
5300
5350
5400
5450

4975'	1.85°	104.72°	4943.31'	243.11'
5070'	2.09°	101.82°	5038.26'	239.98'
5260'	0.59°	187.23°	5228.21'	236.80'
5355'	1.50°	164.09°	5323.19'	236.61'
5449'	0.52°	346.94°	5417.19'	236.41'

PGRC

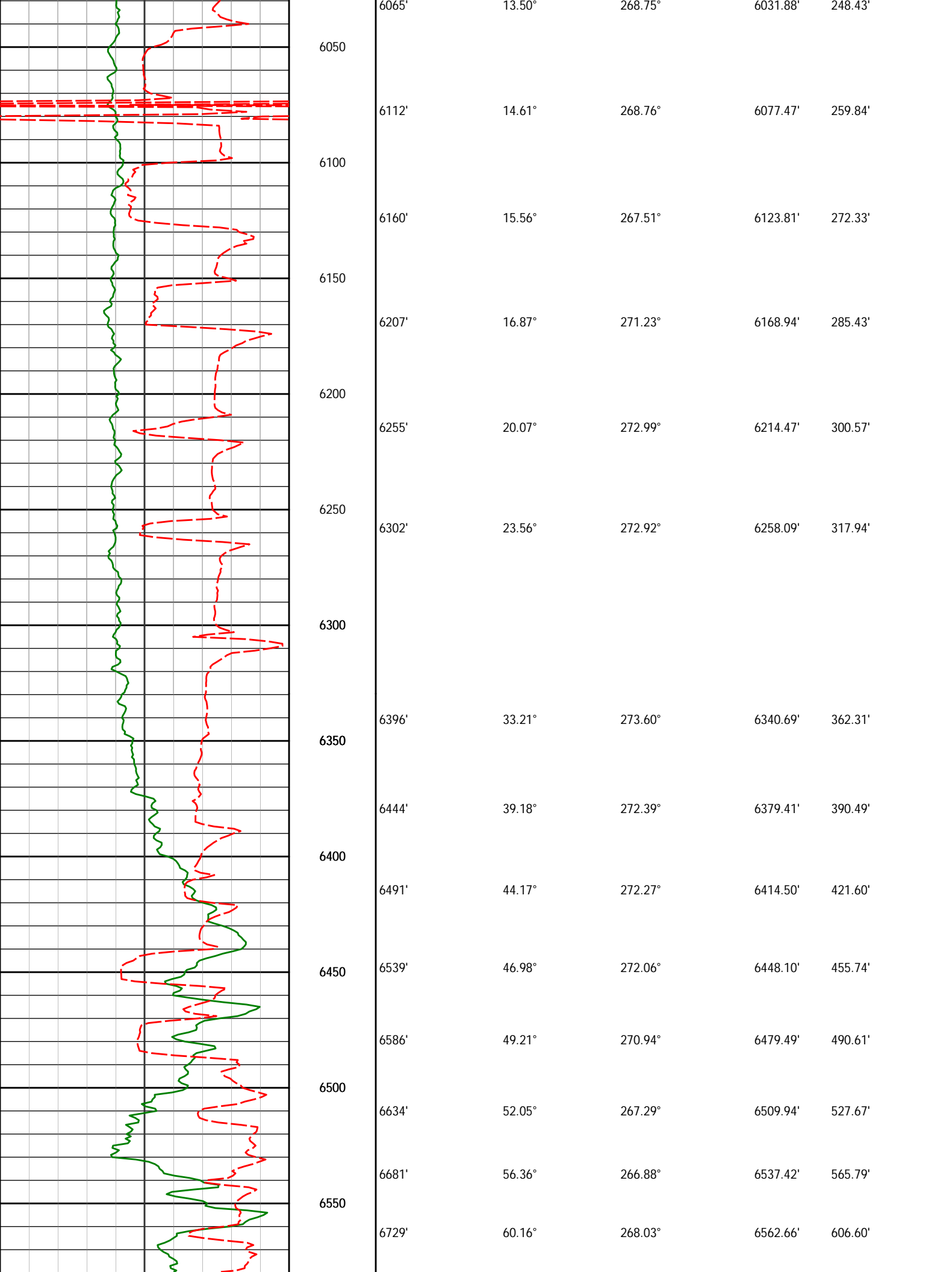
ROPA

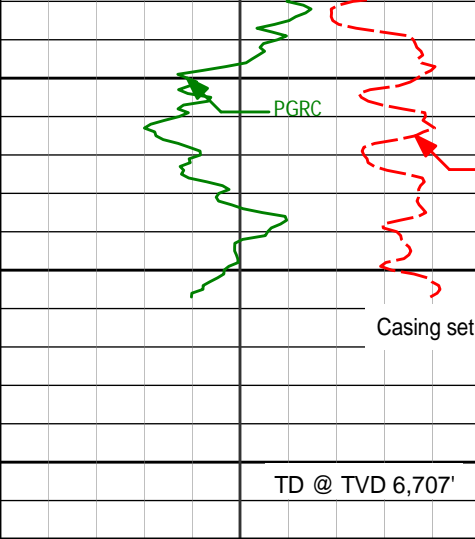


5500	5544'	2.70°	102.43°	5512.15'	234.33'
5550					
5600	5639'	1.20°	75.92°	5607.10'	231.20'
5650					
5700	5734'	1.11°	309.15°	5702.09'	230.90'
5750					
5800	5829'	1.01°	300.48°	5797.07'	232.28'
5850	5866'	0.76°	345.99°	5834.07'	232.60'
<Run 200>	5922'	0.64°	346.84°	5890.06'	232.73'
5900					
5950					
6000	6017'	8.07°	272.68°	5984.74'	239.47'

PGRC

ROPA





6776'	63.34°	268.68°	6584.91'	647.99'
6824'	66.80°	269.05°	6605.14'	691.48'
6871'	69.47°	269.71°	6622.64'	735.06'
6919'	73.46°	269.79°	6637.89'	780.51'
6966'	77.44°	269.61°	6649.70'	825.94'
7019'	83.86°	269.32°	6658.31'	878.16'

Avg Rate of Penetration ROPA ----- feet per hr		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
500	0						
PCG Gamma Ray PGRC _____ api							
0	300						

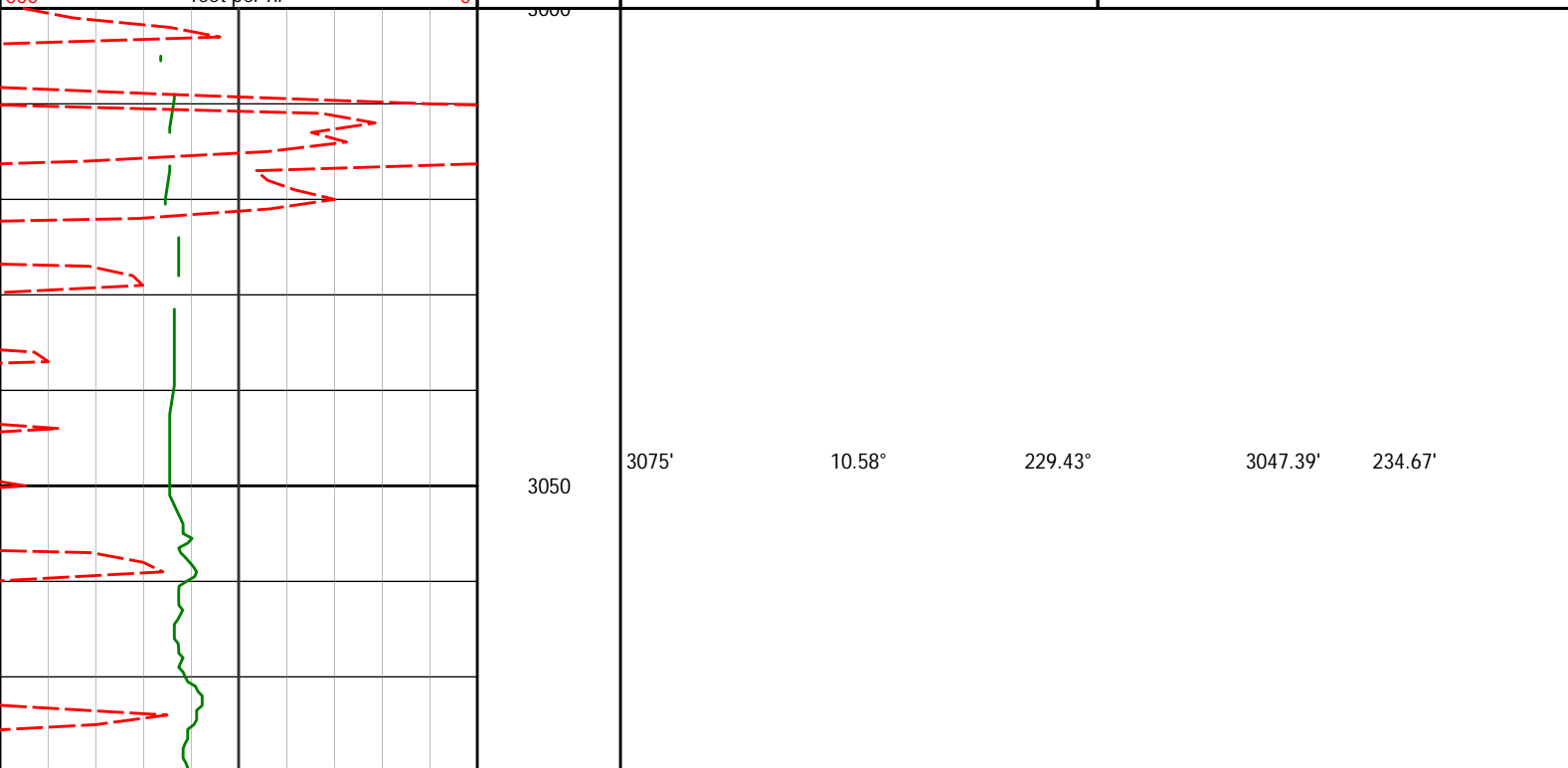
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Sperry Drilling Services

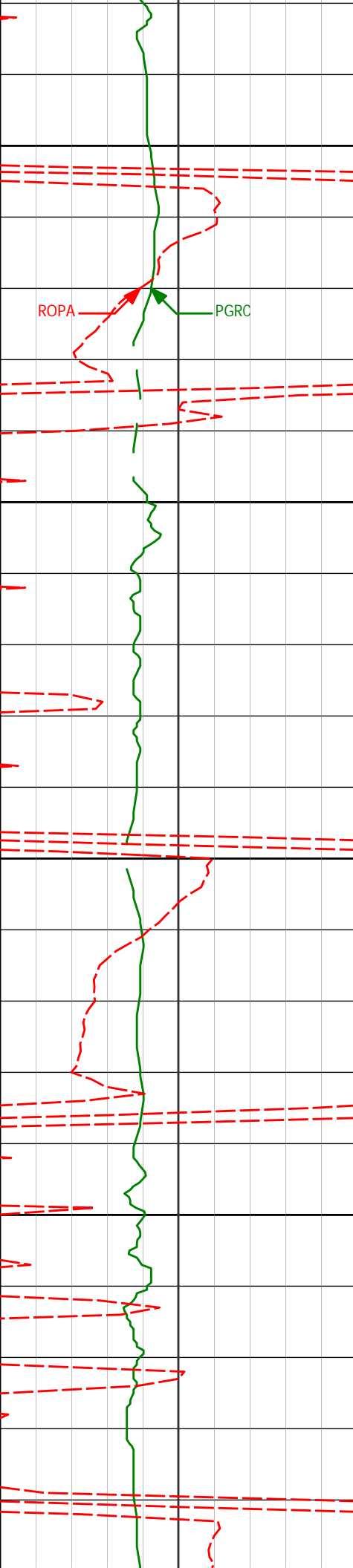
TVD Detail Log 1:240

Noble Energy
 Wells Ranch USX AA23-67HN
 H&P 343
 T6N-R63W

PCG Gamma Ray PGRC _____ api		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
0	300						
Avg Rate of Penetration ROPA ----- feet per hr							
500	0						



3075'	10.58°	229.43°	3047.39'	234.67'
-------	--------	---------	----------	---------



3100

ROPA

PGRC

3170'

10.89°

236.39°

3140.73'

249.30'

3150

3200

3265'

7.23°

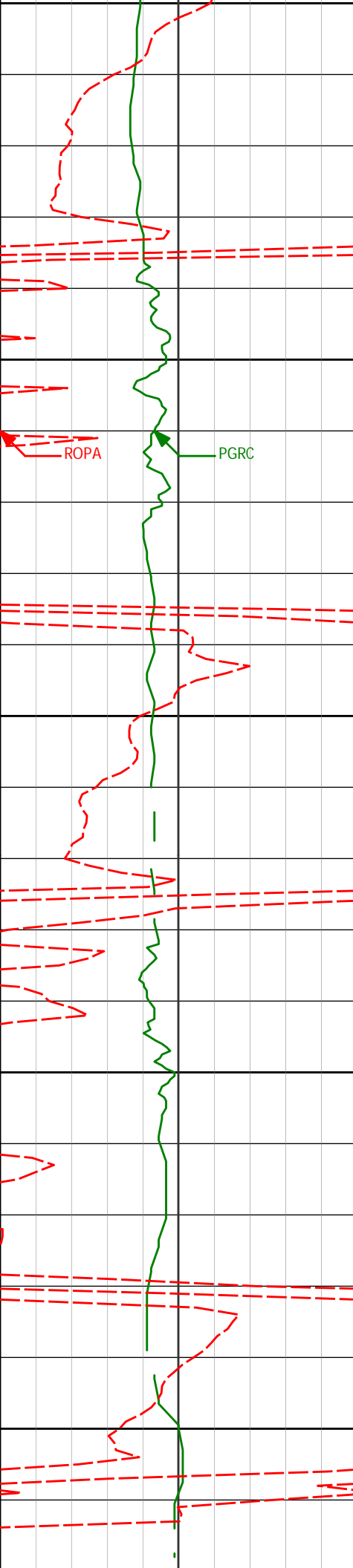
233.44°

3234.53'

262.02'

3250

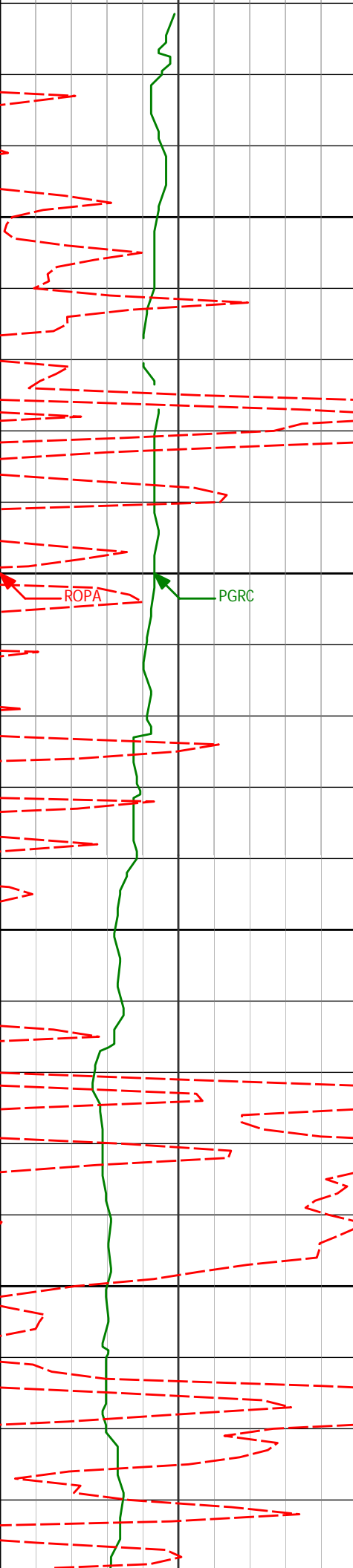
3300



3360' 2.98° 250.90° 3329.14' 269.38'

3455' 1.10° 249.95° 3424.07' 272.62'

3550' 2.12° 40.46° 3519.06' 272.29'



3550

3600

3650

3700

ROPA

PGRC

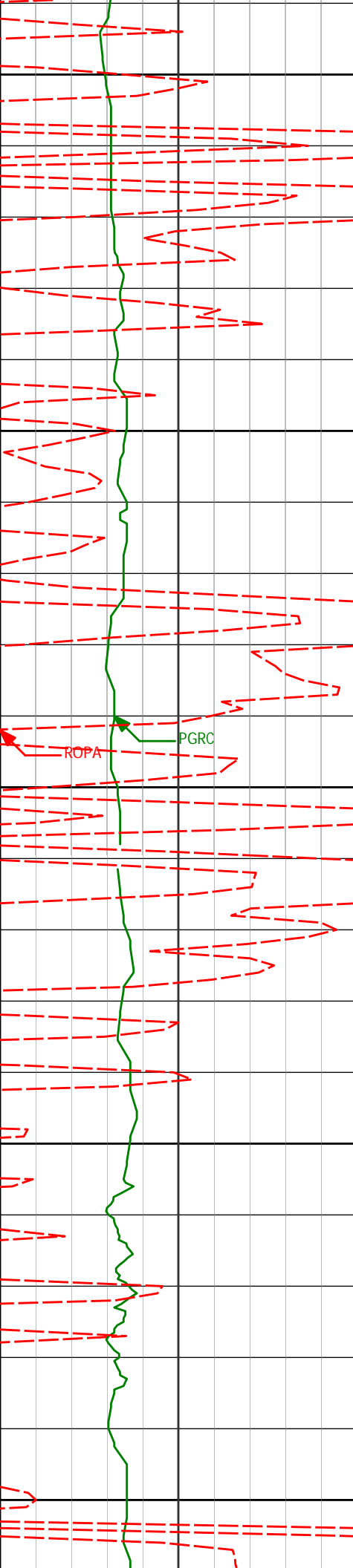
3740'

2.58°

48.24°

3708.90'

266.54'



3750

3800

3850

3900

3950

3835'

3.05°

42.69°

3803.78'

263.07'

3930'

2.66°

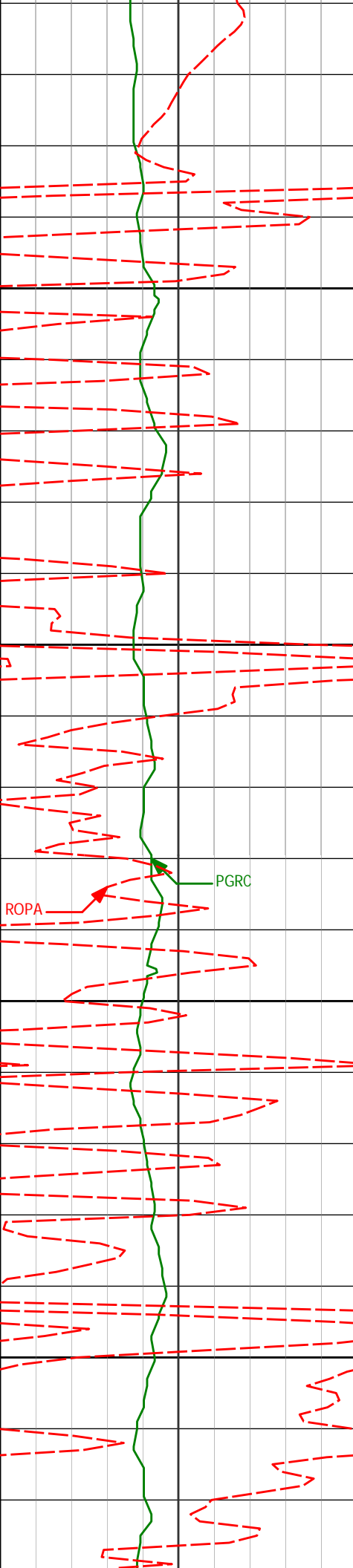
41.98°

3898.66'

259.70'

ROPA

PGRC



4025'

0.89°

95.24°

3993.62'

257.41'

4000

4050

4120'

1.30°

89.58°

4088.60'

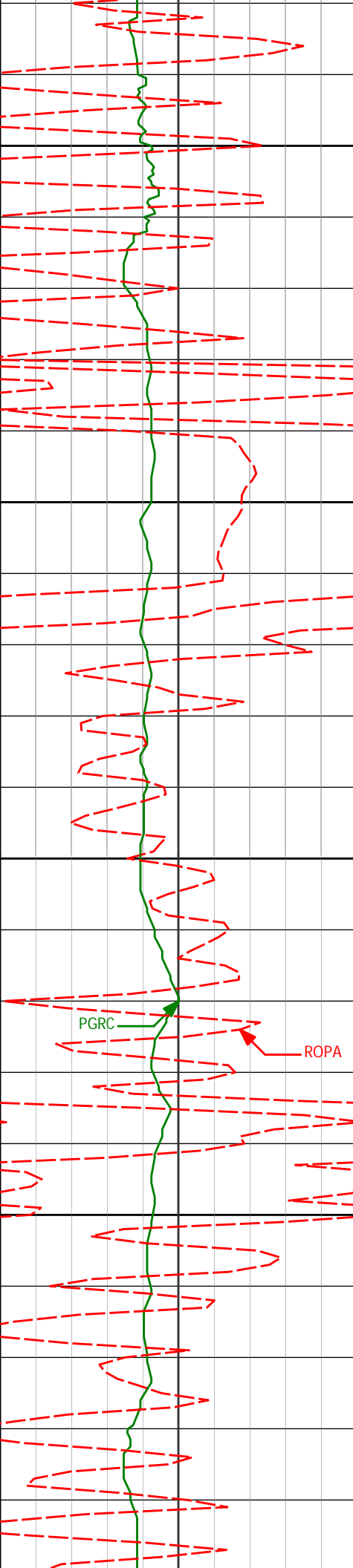
255.60'

4100

4150

PGRC

ROPA



4215'

1.79°

110.17°

4183.57'

253.17'

4200

4250

4310'

1.03°

145.43°

4278.54'

251.36'

4300

PGRC

ROPA

4350

4405'

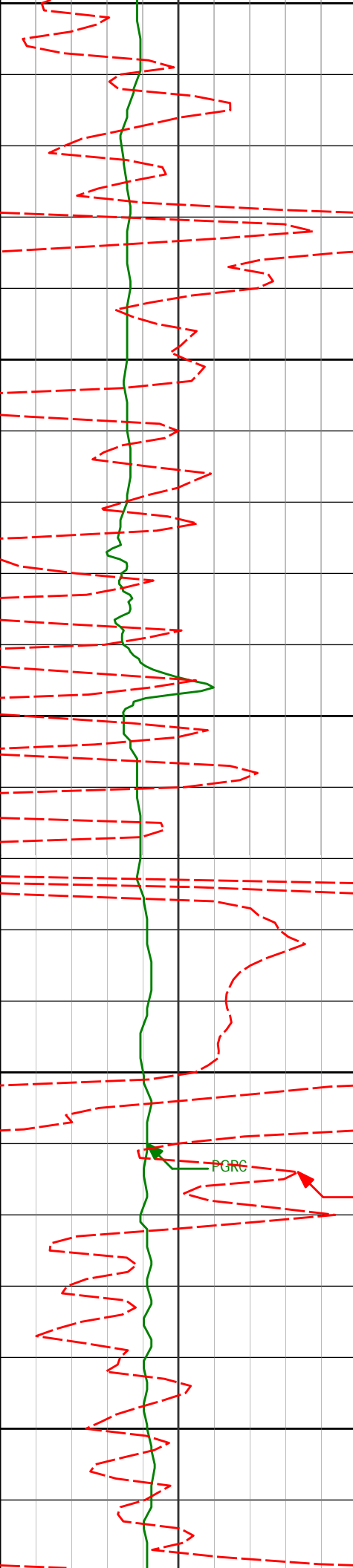
1.98°

168.16°

4373.51'

250.66'

4400



4400

4450

4500

4550

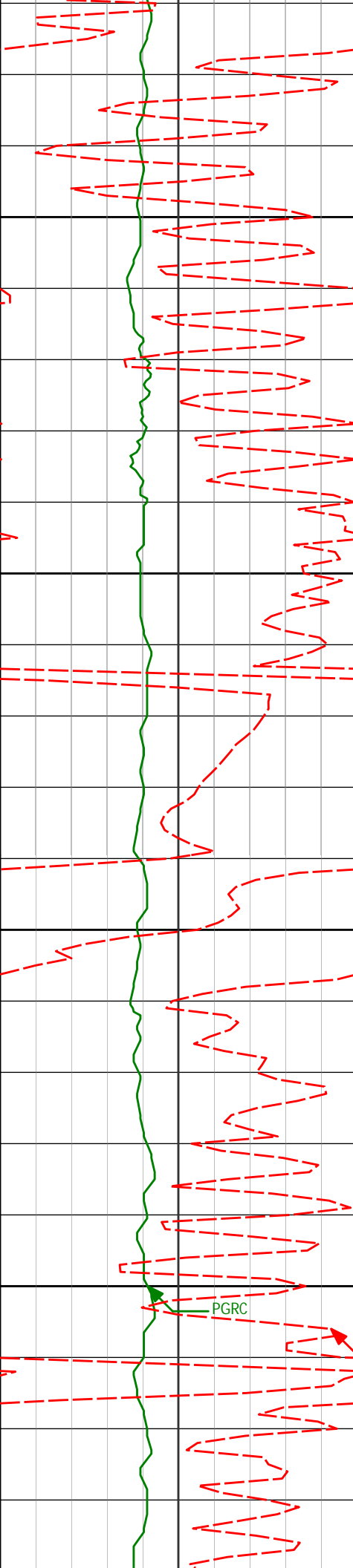
4600

4500' 1.64° 162.88° 4468.46' 250.08'

4595' 1.54° 174.73° 4563.42' 249.70'

PGRC

ROPA



4650

4690'

1.24°

149.35°

4658.40'

249.17'

4700

4750

4785'

0.85°

75.11°

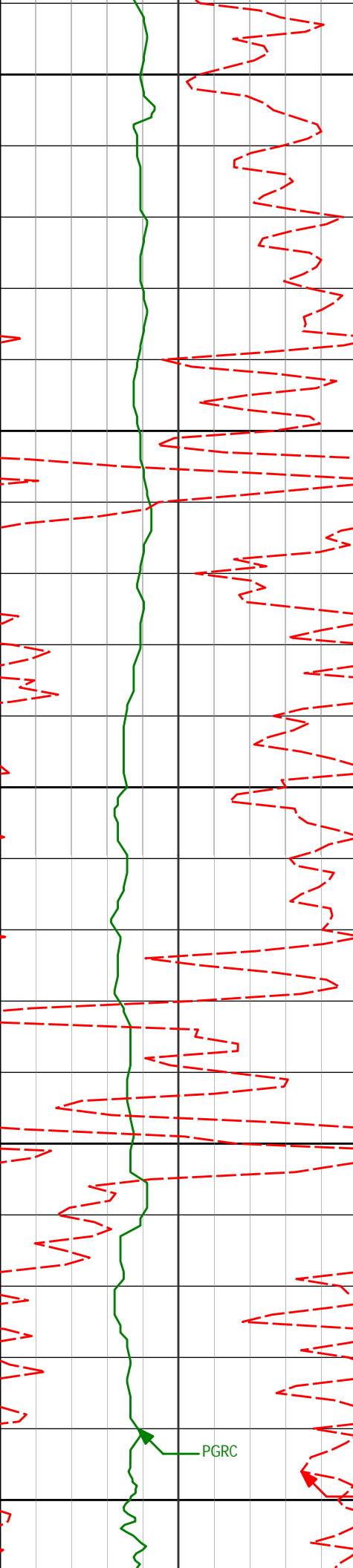
4753.38'

248.00'

4800

PGRC

ROPA



4850

4880'

1.75°

106.61°

4848.36'

245.94'

4900

4950

4975'

1.85°

104.72°

4943.31'

243.11'

5000

5070'

2.09°

101.82°

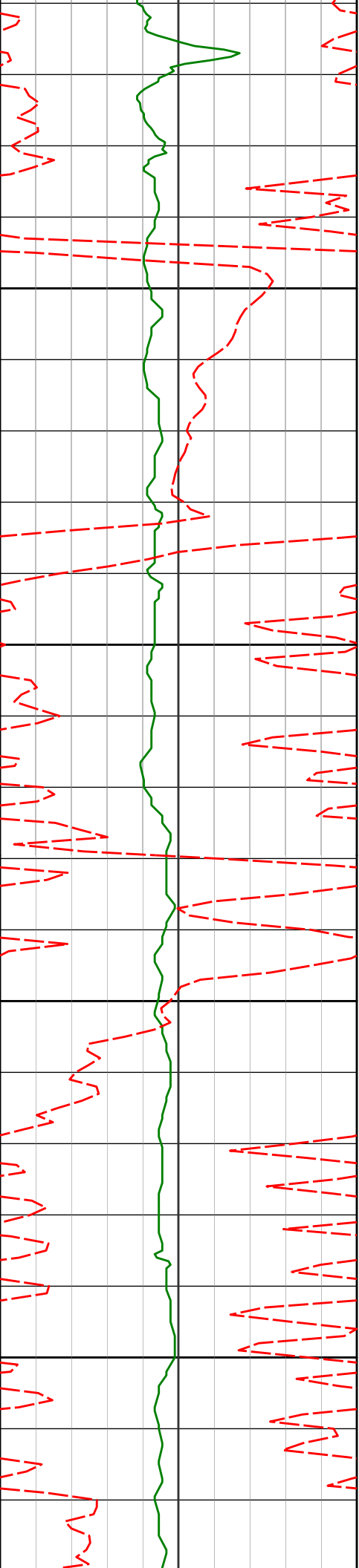
5038.26'

239.98'

PGRC

ROPA

5050



5100

5150

5200

5250

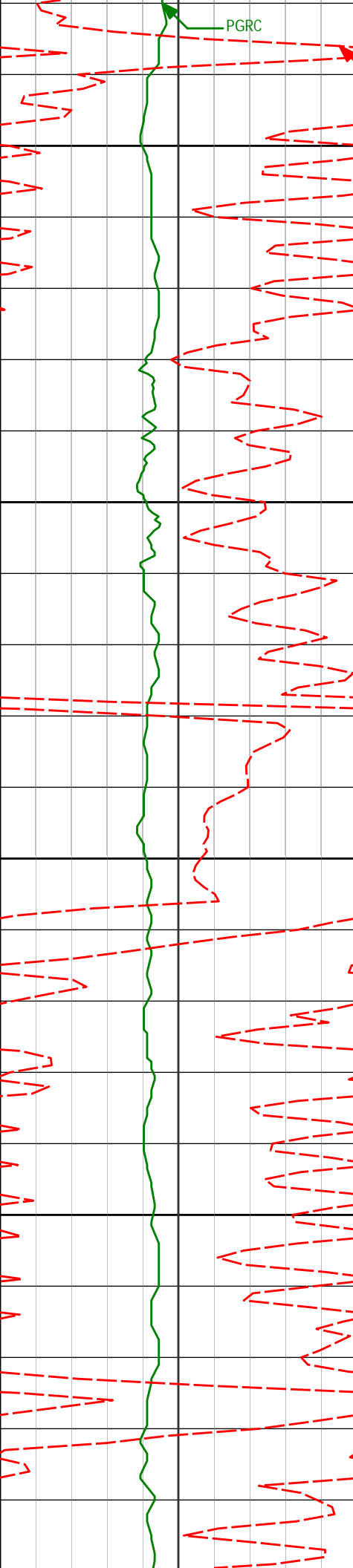
5260'

0.59°

187.23°

5228.21'

236.80'



PGRC

ROPA

5300

5355'

1.50°

164.09°

5323.19'

236.61'

5350

5400

5449'

0.52°

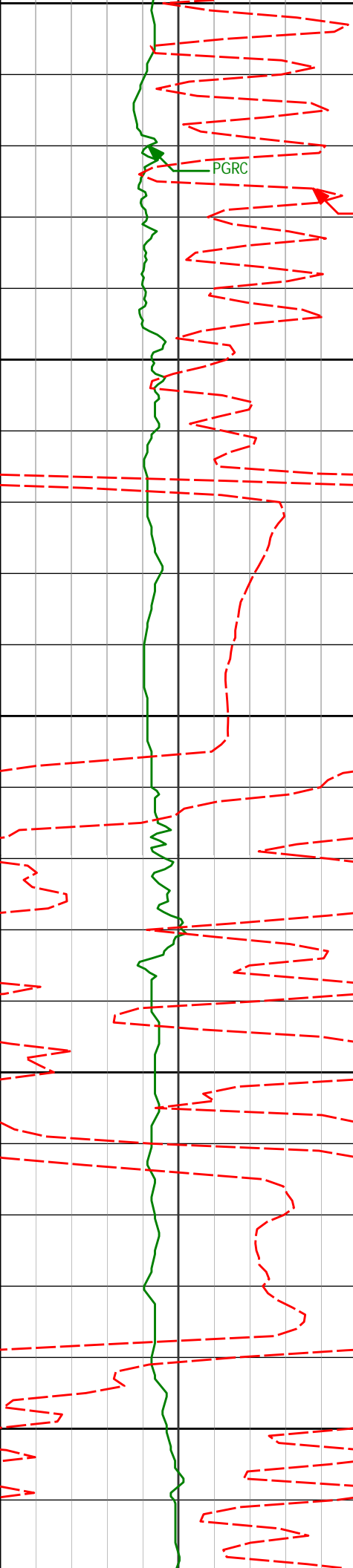
346.94°

5417.19'

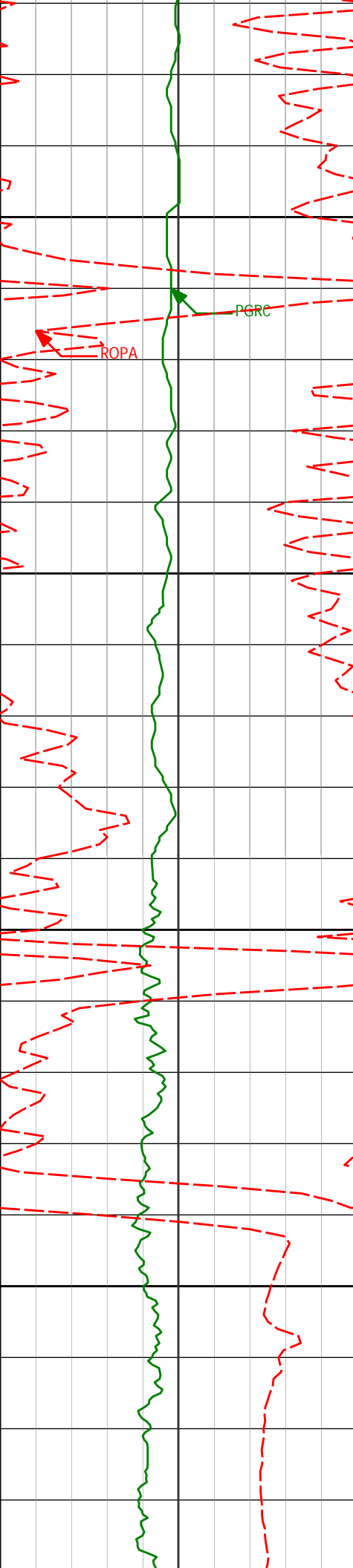
236.41'

5450

5500



Vertical Label	Horizontal Label	Angle	Value 1	Value 2
5500				
5544'	2.70°	102.43°	5512.15'	234.33'
5550				
5600				
5639'	1.20°	75.92°	5607.10'	231.20'
5650				
5700				
5734'	1.11°	309.15°	5702.09'	230.90'



5750

PGRC

ROPA

5800

5829'

1.01°

300.48°

5797.07'

232.28'

5866'

0.76°

345.99°

5834.07'

232.60'

5850

<Run 200>

5922'

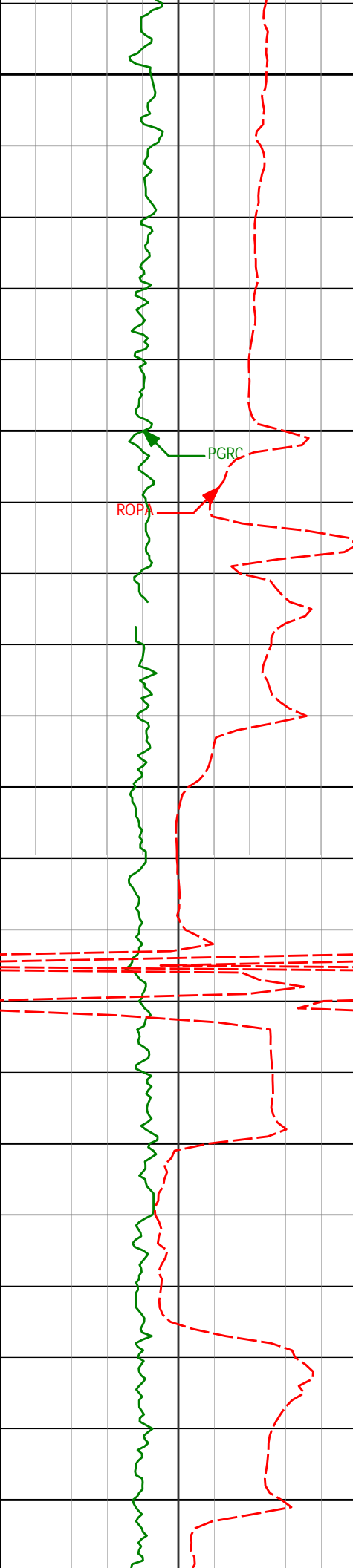
0.64°

346.84°

5890.06'

232.73'

5900



5950

6017'

8.07°

272.68°

5984.74'

239.47'

6000

PGRC

ROP

6065'

13.50°

268.75°

6031.88'

248.43'

6050

6112'

14.61°

268.76°

6077.47'

259.84'

6100

6160'

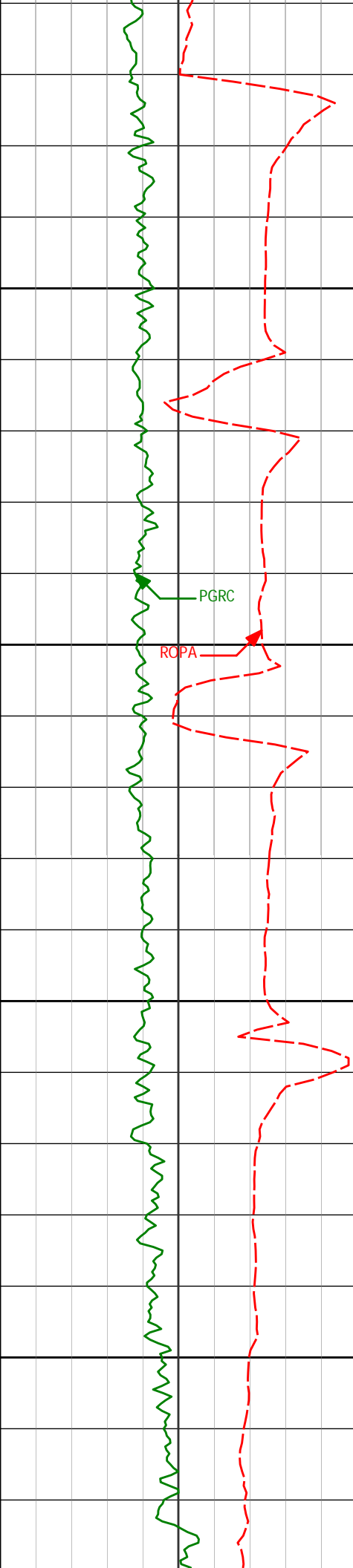
15.56°

267.51°

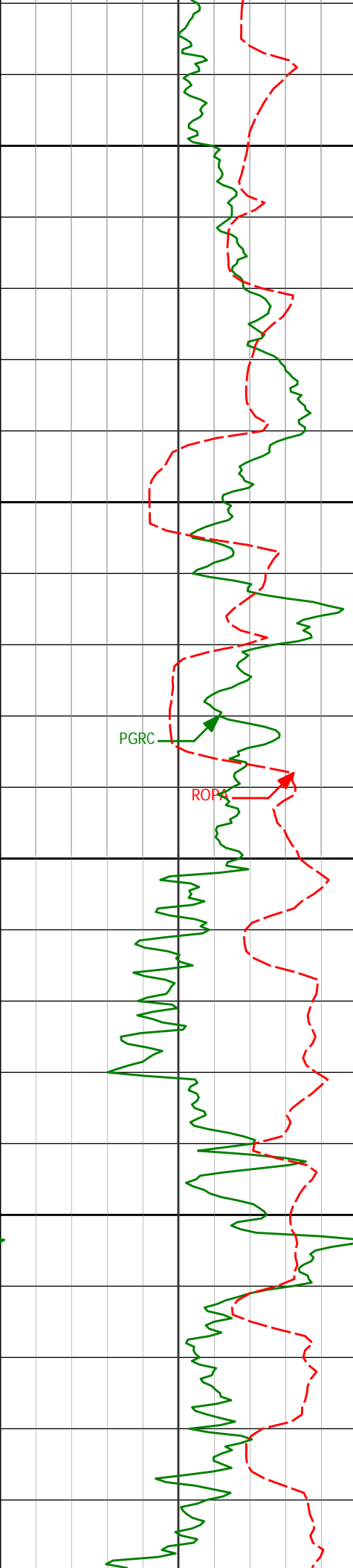
6123.81'

272.33'

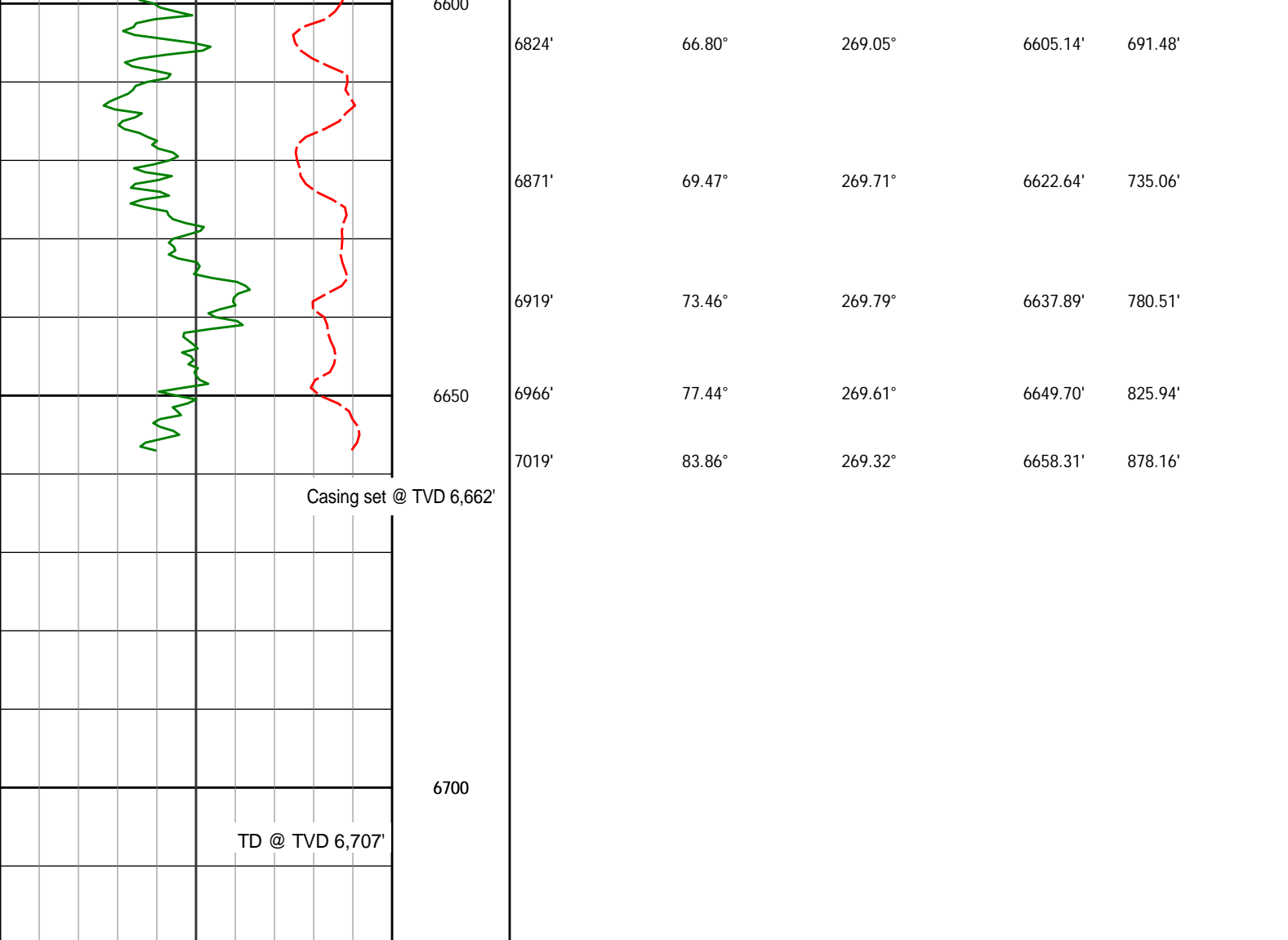
6150



6207'	16.87°	271.23°	6168.94'	285.43'
6255'	20.07°	272.99°	6214.47'	300.57'
6302'	23.56°	272.92°	6258.09'	317.94'
6396'	33.21°	273.60°	6340.69'	362.31'
6444'	39.18°	272.20°	6379.41'	390.40'



6444	39.18	272.39	6379.41	390.49
6491'	44.17°	272.27°	6414.50'	421.60'
6450				
6539'	46.98°	272.06°	6448.10'	455.74'
6586'	49.21°	270.94°	6479.49'	490.61'
6500				
6634'	52.05°	267.29°	6509.94'	527.67'
6681'	56.36°	266.88°	6537.42'	565.79'
6550				
6729'	60.16°	268.03°	6562.66'	606.60'
6776'	63.34°	268.68°	6584.91'	647.99'
6600				



Avg Rate of Penetration ROPA 500 feet per hr 0		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
PCG Gamma Ray PGRC 0 api 300							



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
 Wells Ranch USX AA23-67HN
 Wattenburg
 Weld Colorado
 USA
 CA-XX-0900544014

Surveys are tied to the surface shoe at 663' MD and assume an inclination and azimuth of zero. The 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
663.00	0.00	0.00	663.00	0.00 N	0.00 E	0.00	0.00
717.00	0.04	106.02	717.00	0.01 S	0.02 E	-0.02	0.08
811.00	0.18	274.29	811.00	0.00 S	0.10 W	0.10	0.24
903.00	0.19	314.15	903.00	0.12 N	0.36 W	0.35	0.14
995.00	0.28	319.18	995.00	0.15 N	0.67 W	0.64	0.20

995.00	0.38	319.18	995.00	0.43 N	0.87 W	0.84	0.20
1088.00	0.37	321.42	1088.00	0.92 N	1.05 W	1.00	0.02
1274.00	0.24	298.19	1273.99	1.57 N	1.77 W	1.69	0.10
1367.00	0.28	340.75	1366.99	1.88 N	2.02 W	1.92	0.21
1460.00	0.22	359.42	1459.99	2.28 N	2.10 W	1.98	0.11
1555.00	4.01	253.28	1554.92	1.51 N	5.28 W	5.20	4.29
1650.00	5.96	241.14	1649.55	1.82 S	12.79 W	12.86	2.33
1745.00	7.20	238.85	1743.93	7.29 S	22.20 W	22.55	1.33
1840.00	8.42	239.61	1838.04	13.89 S	33.30 W	33.99	1.29
1935.00	9.97	228.86	1931.82	22.82 S	45.50 W	46.64	2.43
2030.00	12.12	236.23	2025.06	33.78 S	59.99 W	61.68	2.70
2125.00	11.92	229.69	2117.99	45.67 S	75.76 W	78.05	1.45
2220.00	11.74	227.61	2210.97	58.53 S	90.39 W	93.32	0.49
2315.00	13.45	228.22	2303.68	72.41 S	105.76 W	109.41	1.80
2410.00	12.48	226.78	2396.26	86.80 S	121.48 W	125.85	1.07
2505.00	12.77	229.24	2488.96	100.68 S	136.91 W	141.99	0.64
2600.00	12.09	229.64	2581.73	113.97 S	152.44 W	158.20	0.72
2695.00	12.48	234.60	2674.56	126.36 S	168.39 W	174.77	1.18
2790.00	11.69	232.25	2767.46	138.20 S	184.36 W	191.34	0.98
2885.00	10.87	231.86	2860.62	149.62 S	199.02 W	206.58	0.87
2980.00	10.43	230.68	2953.98	160.60 S	212.72 W	220.83	0.52
3075.00	10.58	229.43	3047.39	171.72 S	225.99 W	234.67	0.29
3170.00	10.89	236.39	3140.73	182.36 S	240.09 W	249.30	1.40
3265.00	7.23	233.44	3234.53	190.89 S	252.37 W	262.02	3.88
3360.00	2.98	250.90	3329.14	195.27 S	259.51 W	269.38	4.72
3455.00	1.10	249.95	3424.07	196.39 S	262.70 W	272.62	1.98
3550.00	2.12	40.46	3519.06	195.37 S	262.42 W	272.29	3.29
3740.00	2.58	48.24	3708.90	189.85 S	256.96 W	266.54	0.29
3835.00	3.05	42.69	3803.78	186.57 S	253.65 W	263.07	0.58
3930.00	2.66	41.98	3898.66	183.07 S	250.46 W	259.70	0.42
4025.00	0.89	95.24	3993.62	181.50 S	248.25 W	257.41	2.36
4120.00	1.30	89.58	4088.60	181.56 S	246.44 W	255.60	0.44
4215.00	1.79	110.17	4183.57	182.07 S	243.97 W	253.17	0.77
4310.00	1.03	145.43	4278.54	183.28 S	242.10 W	251.36	1.18
4405.00	1.98	168.16	4373.51	185.58 S	241.28 W	250.66	1.16
4500.00	1.64	162.88	4468.46	188.48 S	240.55 W	250.08	0.39
4595.00	1.54	174.73	4563.42	191.05 S	240.03 W	249.70	0.36
4690.00	1.24	149.35	4658.40	193.21 S	239.38 W	249.17	0.71
4785.00	0.85	75.11	4753.38	193.92 S	238.18 W	248.00	1.37
4880.00	1.75	106.61	4848.36	194.15 S	236.10 W	245.94	1.18
4975.00	1.85	104.72	4943.31	194.96 S	233.23 W	243.11	0.12
5070.00	2.09	101.82	5038.26	195.70 S	230.05 W	239.98	0.27
5260.00	0.59	187.23	5228.21	197.38 S	226.78 W	236.80	1.12
5355.00	1.50	164.09	5323.19	199.06 S	226.50 W	236.61	1.04
5449.00	0.52	346.94	5417.19	199.83 S	226.26 W	236.41	2.16
5544.00	2.70	102.43	5512.15	199.88 S	224.17 W	234.33	3.12
5639.00	1.20	75.92	5607.10	200.12 S	221.03 W	231.20	1.80
5734.00	1.11	309.15	5702.09	199.30 S	220.78 W	230.90	2.17
5829.00	1.01	300.48	5797.07	198.30 S	222.21 W	232.28	0.20
5866.00	0.76	345.99	5834.07	197.89 S	222.55 W	232.60	1.95
5922.00	0.64	346.84	5890.06	197.23 S	222.71 W	232.73	0.21
6017.00	8.07	272.68	5984.74	196.40 S	229.51 W	239.47	8.34
6065.00	13.50	268.75	6031.88	196.36 S	238.48 W	248.43	11.39
6112.00	14.61	268.76	6077.47	196.61 S	249.89 W	259.84	2.37
6160.00	15.56	267.51	6123.81	197.02 S	262.37 W	272.33	2.09
6207.00	16.87	271.23	6168.94	197.15 S	275.49 W	285.43	3.56
6255.00	20.07	272.99	6214.47	196.57 S	290.68 W	300.57	6.78
6302.00	23.56	272.92	6258.09	195.67 S	308.12 W	317.94	7.43
6396.00	33.21	273.60	6340.69	193.09 S	352.69 W	362.31	10.27
6444.00	39.18	272.39	6379.41	191.63 S	380.98 W	390.49	12.52
6491.00	44.17	272.27	6414.50	190.36 S	412.20 W	421.60	10.61
6539.00	46.98	272.06	6448.10	189.07 S	446.45 W	455.74	5.87
6586.00	49.21	270.94	6479.49	188.16 S	481.42 W	490.61	5.06
6634.00	52.05	267.29	6509.94	188.76 S	518.51 W	527.67	8.34
6681.00	56.36	266.88	6537.42	190.70 S	556.57 W	565.79	9.21
6729.00	60.16	268.03	6562.66	192.50 S	597.34 W	606.60	8.17
6776.00	63.34	268.68	6584.91	193.69 S	638.72 W	647.99	6.87
6824.00	66.80	269.05	6605.14	194.55 S	682.24 W	691.48	7.24
6871.00	69.47	269.71	6622.64	195.02 S	725.85 W	735.06	5.83
6919.00	73.46	269.79	6637.89	195.22 S	771.35 W	780.51	8.31
6966.00	77.44	269.61	6649.70	195.46 S	816.83 W	825.94	8.48
7019.00	83.86	269.32	6658.31	195.95 S	869.10 W	878.16	12.13
7108.00	86.27	269.47	6665.96	196.88 S	957.76 W	966.75	2.71
7155.00	86.80	269.66	6668.80	197.24 S	1004.67 W	1013.62	1.19
7250.00	86.64	269.68	6674.24	197.79 S	1099.51 W	1108.36	0.16

7345.00	87.81	270.06	6678.84	198.01 S	1194.40 W	1203.12	1.30
7440.00	88.68	270.24	6681.75	197.75 S	1289.35 W	1297.94	0.93
7534.00	89.72	270.97	6683.06	196.76 S	1383.34 W	1391.74	1.35
7629.00	91.08	270.84	6682.40	195.26 S	1478.32 W	1486.51	1.43
7724.00	91.94	269.46	6679.90	195.01 S	1573.28 W	1581.33	1.71
7819.00	90.56	269.36	6677.83	195.99 S	1668.25 W	1676.22	1.46
7914.00	88.92	267.50	6678.26	198.59 S	1763.21 W	1771.19	2.60
8009.00	87.72	267.16	6681.05	203.02 S	1858.06 W	1866.14	1.31
8103.00	88.12	267.65	6684.46	207.27 S	1951.90 W	1960.08	0.67
8198.00	88.55	268.82	6687.22	210.20 S	2046.82 W	2055.01	1.32
8293.00	88.98	269.79	6689.26	211.35 S	2141.79 W	2149.91	1.11
8388.00	89.57	269.51	6690.47	211.92 S	2236.78 W	2244.80	0.68
8483.00	91.57	271.36	6689.52	211.20 S	2331.76 W	2339.62	2.87
8577.00	89.94	268.99	6688.28	210.92 S	2425.74 W	2433.46	3.06
8673.00	90.31	268.22	6688.07	213.26 S	2521.71 W	2529.42	0.89
8768.00	88.55	267.42	6689.02	216.88 S	2616.64 W	2624.40	2.03
8863.00	89.01	268.84	6691.04	219.98 S	2711.56 W	2719.36	1.56
8957.00	88.37	269.16	6693.19	221.62 S	2805.52 W	2813.27	0.77
9052.00	90.31	269.46	6694.29	222.76 S	2900.50 W	2908.19	2.07
9147.00	88.64	269.74	6695.16	223.43 S	2995.49 W	3003.08	1.78
9242.00	87.62	268.78	6698.25	224.65 S	3090.43 W	3097.95	1.48
9337.00	88.74	269.43	6701.26	226.14 S	3185.37 W	3192.84	1.36
9432.00	90.31	269.76	6702.06	226.81 S	3280.36 W	3287.74	1.69
9527.00	89.14	269.10	6702.52	227.76 S	3375.35 W	3382.65	1.41
9621.00	89.51	267.55	6703.63	230.50 S	3469.30 W	3476.61	1.69
9716.00	88.95	267.25	6704.91	234.80 S	3564.20 W	3571.60	0.66
9811.00	91.33	268.39	6704.68	238.42 S	3659.12 W	3666.58	2.77
9905.00	89.51	268.10	6703.99	241.29 S	3753.07 W	3760.55	1.96
10000.00	88.86	268.25	6705.35	244.32 S	3848.01 W	3855.52	0.70
10095.00	90.68	268.11	6705.73	247.33 S	3942.96 W	3950.50	1.92
10190.00	89.69	269.64	6705.43	249.20 S	4037.94 W	4045.44	1.91
10285.00	89.08	269.96	6706.45	249.54 S	4132.93 W	4140.33	0.73
10380.00	90.06	270.17	6707.16	249.43 S	4227.93 W	4235.19	1.06
10475.00	87.56	268.48	6709.13	250.56 S	4322.89 W	4330.08	3.17
10570.00	88.30	268.96	6712.56	252.68 S	4417.80 W	4424.97	0.93
10665.00	90.86	270.14	6713.25	253.43 S	4512.79 W	4519.86	2.97
10760.00	90.49	269.67	6712.12	253.58 S	4607.78 W	4614.74	0.63
10855.00	89.78	268.44	6711.90	255.15 S	4702.76 W	4709.67	1.50
10950.00	91.48	268.76	6710.85	257.47 S	4797.73 W	4804.63	1.82
11045.00	90.59	267.99	6709.14	260.17 S	4892.67 W	4899.58	1.24
11092.00	91.11	267.82	6708.44	261.89 S	4939.63 W	4946.57	1.17
11155.00	91.11	267.82	6707.22	264.28 S	5002.58 W	5009.55	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 267.00 DEGREES (GRID)
A TOTAL CORRECTION OF 7.70 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11155.00 FEET
IS 5009.55 FEET ALONG 266.98 DEGREES (GRID)**