

PCG Pressure Case Gamma PCD Pressure Case Directional

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	28-Mar-14	29-Mar-14			
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)	634.99	5,856.88			
Log End Depth (TVD, ft)	5,856.88	6,559.34			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	27-Mar-14 20:15	28-Mar-14 20:30			
Drill/Wipe End Date and Time	28-Mar-14 10:45	29-Mar-14 10:30			
Min Inc (deg) @ Depth (TVD, ft)	0.10 @ 4,383.97	0.89 @ 5,898.88			
Max Inc (deg) @ Depth (TVD, ft)	9.04 @ 2,302.57	81.04 @ 6,552.61			
Bit TFA(in2) / Bit Type	1.24 / PDC	1.24 / PDC			
Flow Rate (gpm)	600.00	577.42			
Max AV (fpm) / CV (fpm) @ MWD	417.2 / 500.0	398.7 / 425.0			
Fluid Type	Native/Spud Mud	Native/Spud Mud			
Density (ppg) / Viscosity (spqt)	9.65 / 38.00	10.30 / 42.00			
Filtrate CL (ppm)	1,800.00	1,800.00			
pH / Fluid Loss (mptm)	9.70 / 10	9.90 / 8			
PV (cP) / YP (lbf2)	9 / 13.00	13 / 14.00			
% Solids / % Sand	1.7 / 0.20	10.4 / 0.15			
% Oil / Oil:Water Ratio	NA / NA	NA / NA			
Rm @ Measured Temp (degF)	N/A @ N/A	NA @ NA			
Rmf @ Measured Temp (degF)	N/A @ N/A	NA @ NA			
Rmc @ Measured Temp (degF)	N/A @ N/A	NA @ NA			
Max Tool Temp (in F) / S	125.50 / PCM	122.00 / PCM			

Max Tool Temp (degF) / Source	165.58 / PCM	162.80 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	NA @ NA			
Lead MWD Engineer	Brett Vandergon	Brett Vandergon			
Customer Representative	Matt Settles	Matt Settles			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11341327	11341327			
Insert Serial Number	11619995	11619995			
Date and Time Initialized	26-Mar-14 17:51	01-Jan-70 00:00			
Date and Time Read	29-Mar-14 18:33	29-Mar-14 18:43			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	57.00	55.00			
Software Version	6.21	6.21			
Sub Serial Number	11341327	11341327			
Sonde Serial Number	11833228	11833228			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	307.94	55.92			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.69	47.57			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341327	11341327			
Insert/Sonde Serial Number	11681019	11681019			

REMARKS

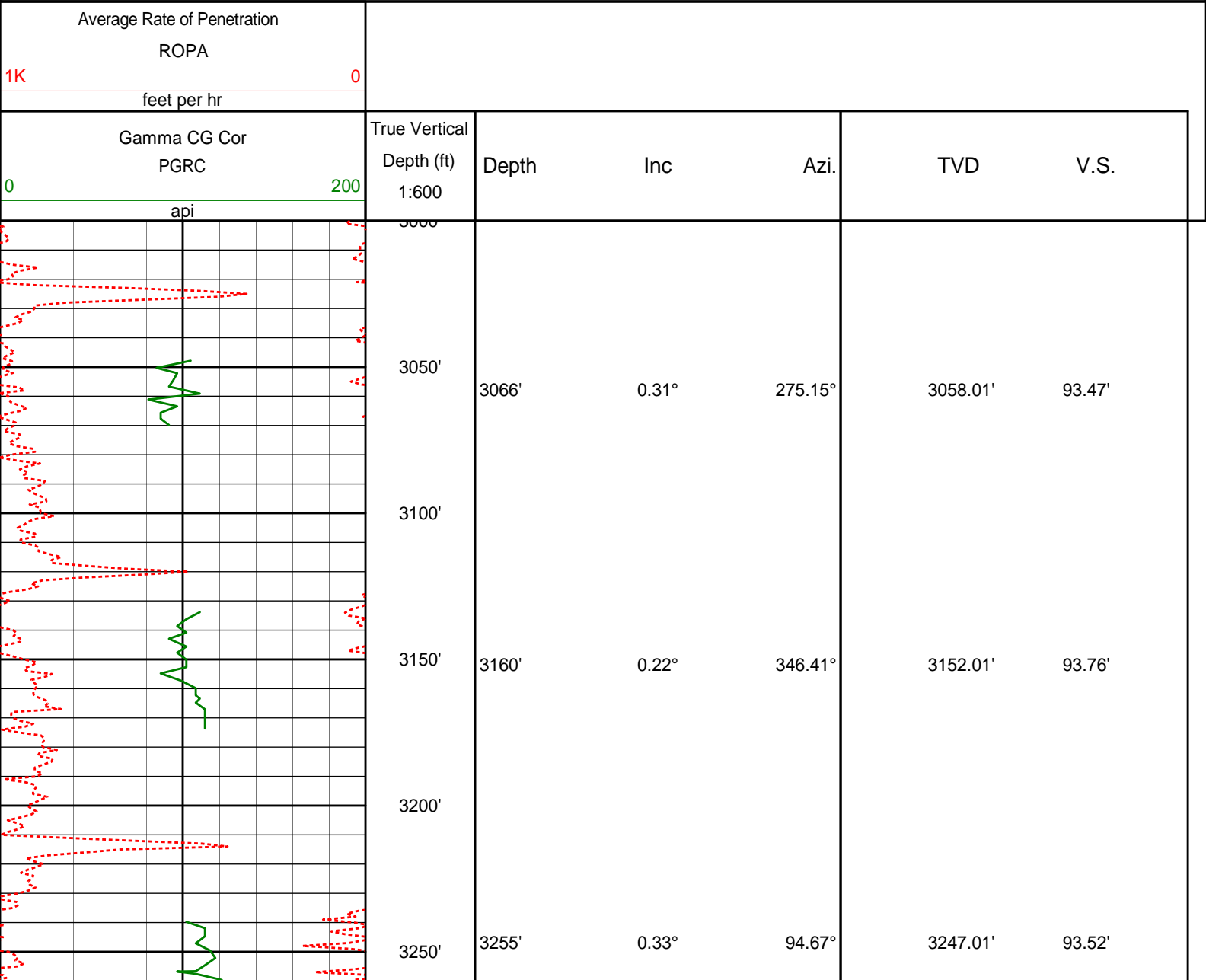
1. All depths are true vertical depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annual velocities are calculated using the "Power Law" model for water 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 8.0

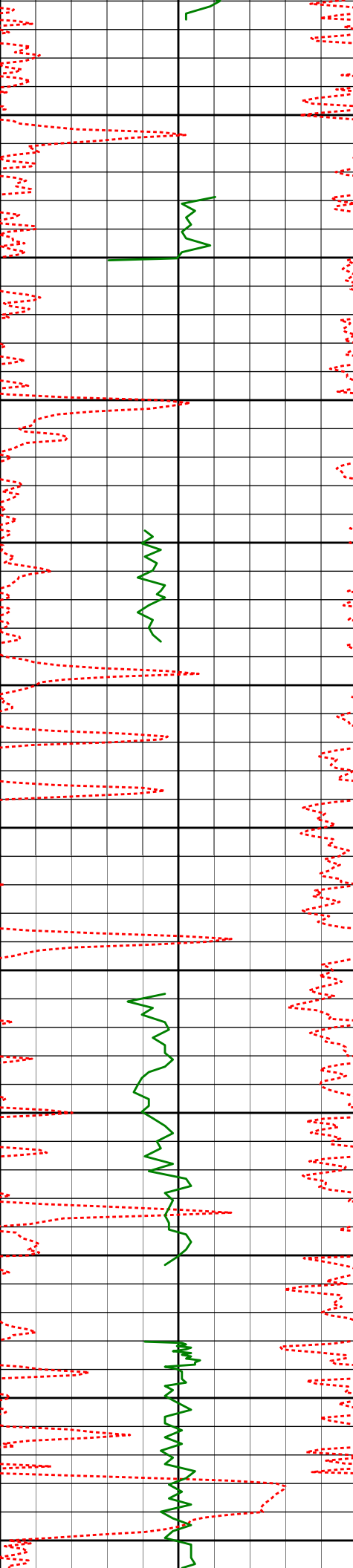
WARRANTY

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HALLIBURTON

TVD Main Log 1:600





3300'

3350'

3400'

3450'

3500'

3550'

3600'

3650'

3700'

3750'

3800'

3350'

3444'

3539'

3634'

3728'

0.62°

0.47°

0.56°

0.88°

0.77°

286.56°

225.25°

193.62°

204.33°

204.37°

3342.01'

3436.01'

3531.00'

3626.00'

3719.99'

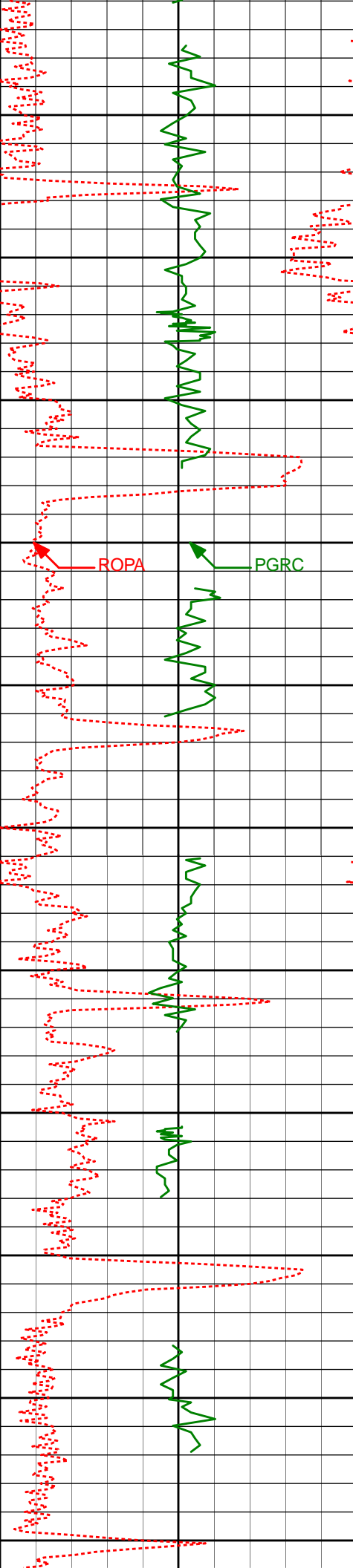
93.74'

94.50'

94.91'

95.35'

95.95'



3850'

3900'

3950'

4000'

4050'

4100'

4150'

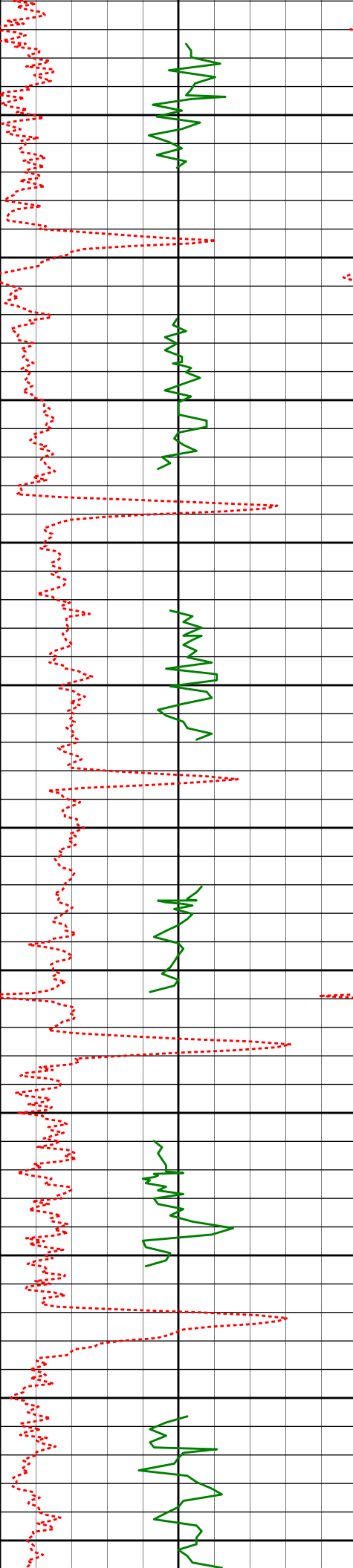
4200'

4250'

4300'

4350'

3823'	0.62°	249.05°	3814.98'	96.71'
3918'	0.72°	235.47°	3909.97'	97.70'
4013'	0.23°	213.17°	4004.97'	98.31'
4108'	0.17°	36.01°	4099.97'	98.33'
4202'	0.13°	230.77°	4193.97'	98.33'
4297'	0.18°	179.46°	4288.97'	98.42'



4392'

4400'

4450'

4487'

4500'

4550'

4582'

4600'

4650'

4677'

4700'

4750'

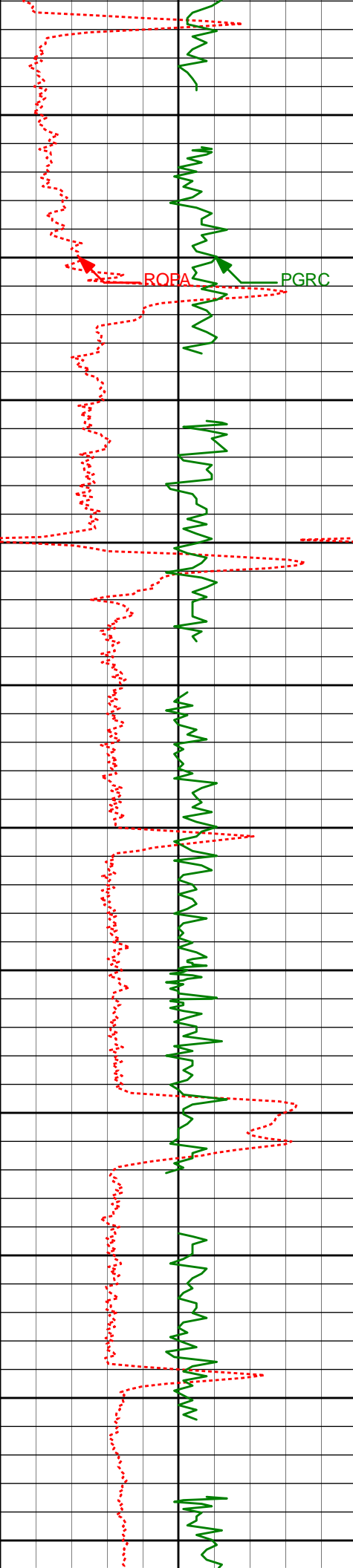
4771'

4800'

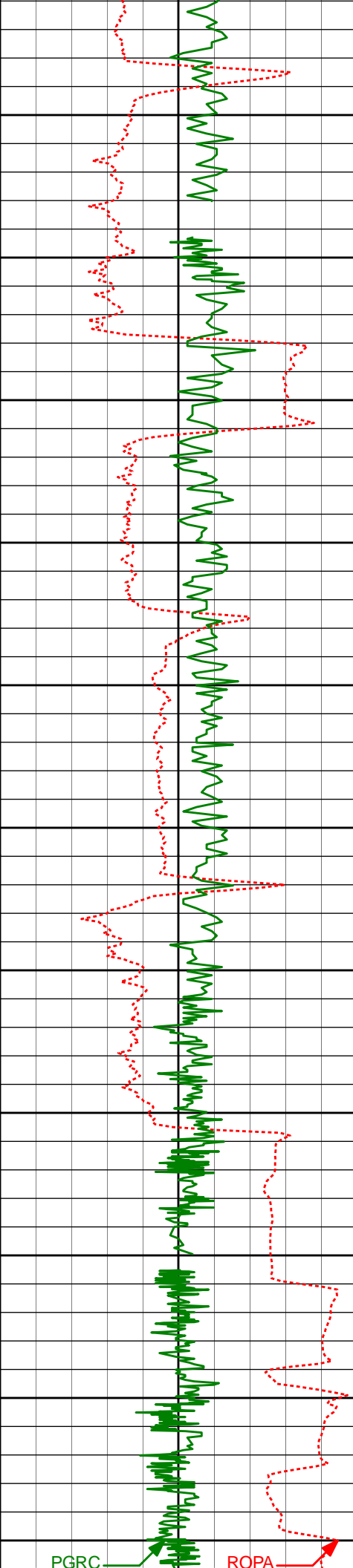
4850'

4900'

4392'	0.10°	299.47°	4383.97'	98.50'
4487'	0.28°	1.94°	4478.97'	98.55'
4582'	0.37°	308.51°	4573.97'	98.77'
4677'	0.63°	319.97°	4668.96'	99.33'
4771'	0.52°	301.43°	4762.96'	100.01'
4866'	0.18°	322.68°	4857.96'	100.46'



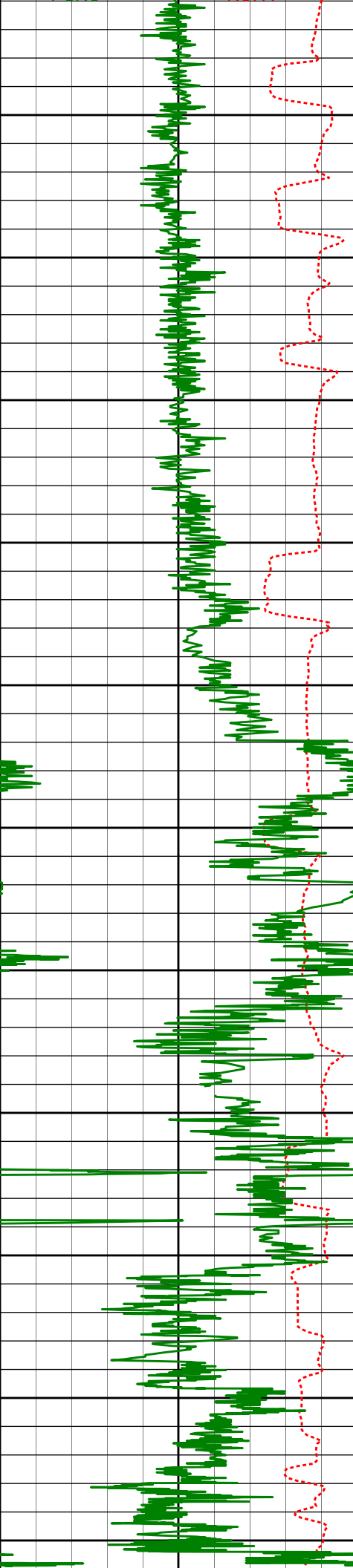
4950'	4961'	0.13°	324.35°	4952.96'	100.60'
5000'					
5050'	5056'	0.39°	299.79°	5047.96'	100.94'
5100'					
5150'	5151'	0.80°	243.36°	5142.95'	101.82'
5200'					
5250'	5246'	0.80°	265.98°	5237.94'	103.08'
5300'					
5350'	5340'	0.73°	303.58°	5331.93'	104.22'
5400'					
5450'	5435'	0.89°	265.43°	5426.92'	105.45'



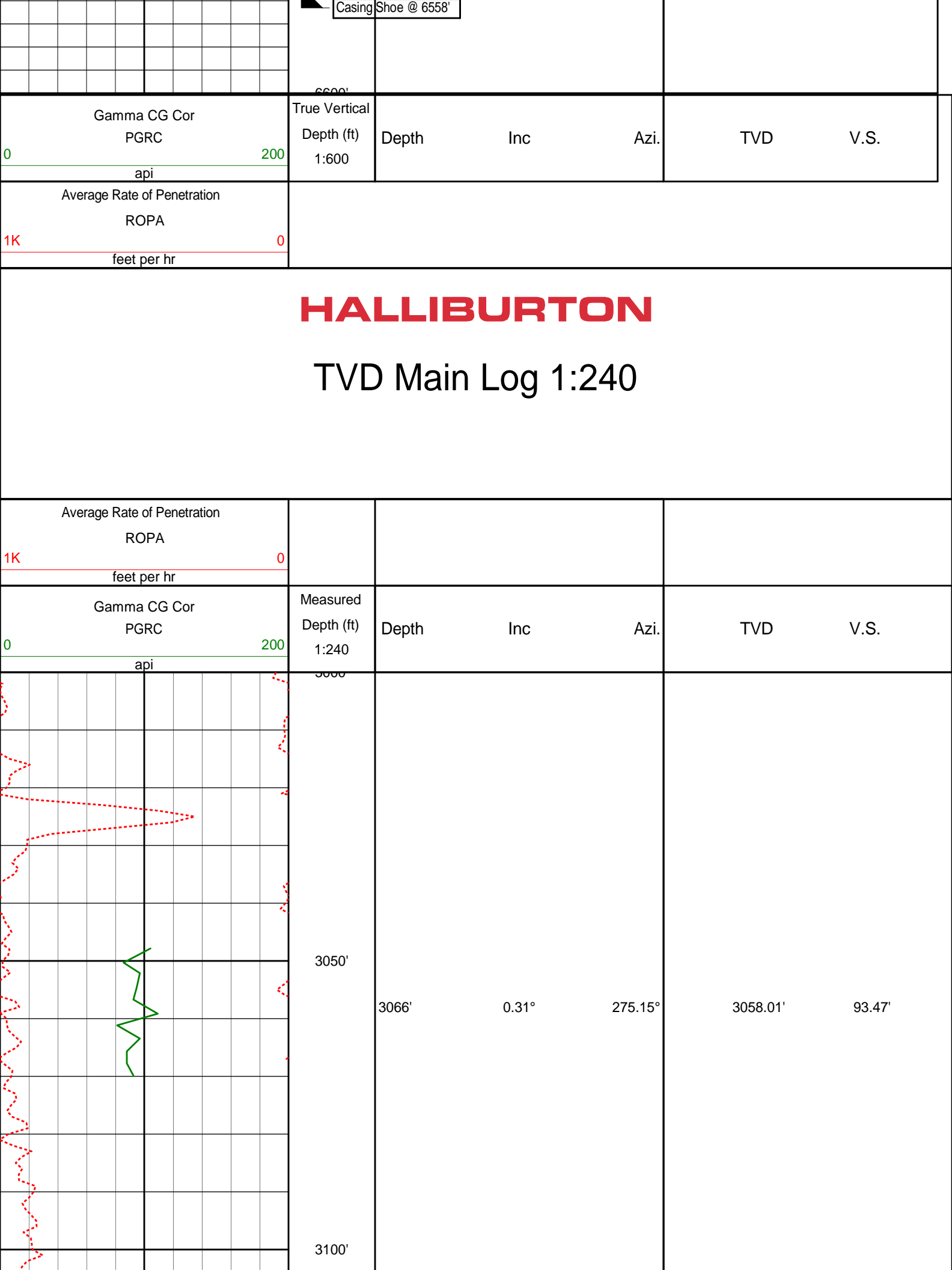
5500'				
5530'	0.81°	288.19°	5521.91'	106.82'
5550'				
5600'				
5650'				
5700'				
5719'	0.65°	278.74°	5710.90'	109.13'
5750'				
5800'				
5812'	0.86°	276.09°	5803.89'	110.34'
5850'				
Run 200				
5900'				
5907'	0.89°	287.28°	5898.88'	111.75'
5950'				
5955'	3.88°	270.43°	5946.83'	113.72'
6000'				
6002'	7.18°	265.40°	5993.61'	118.25'

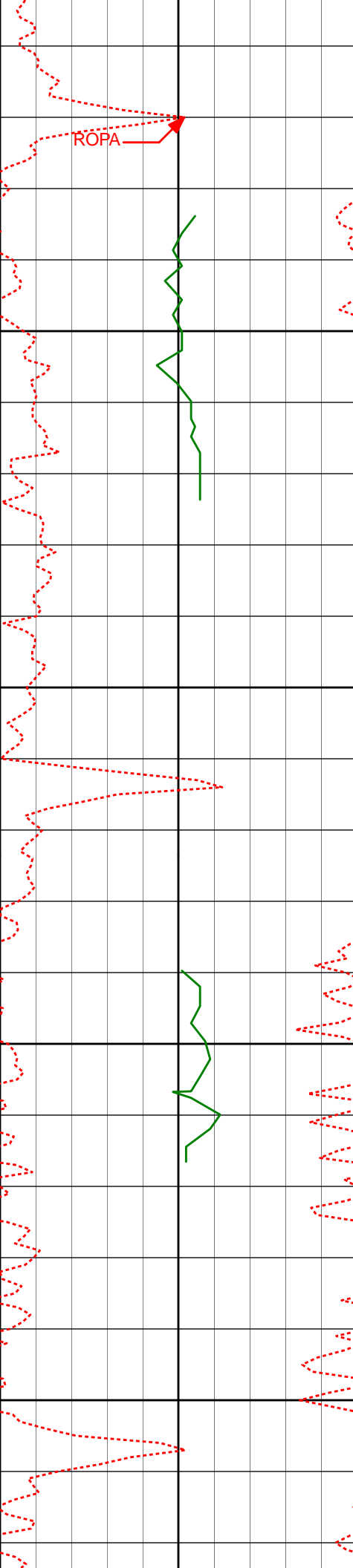
PGRC

ROPA



6050'	6050'	10.67°	260.48°	6041.02'	125.64'
6097'	6097'	13.82°	264.98°	6086.95'	135.55'
6100'					
6150'					
6192'	6192'	22.83°	269.77°	6177.04'	165.37'
6200'					
6250'					
6287'	6287'	30.17°	269.82°	6262.00'	207.72'
6300'					
6381'	6381'	40.49°	267.13°	6338.59'	261.99'
6350'					
6400'	6476'	55.14°	266.62°	6402.21'	332.12'
6450'	6571'	61.81°	268.39°	6451.86'	412.99'
6500'	6666'	66.70°	267.79°	6493.11'	498.49'
6760'	6760'	70.65°	270.89°	6527.30'	586.02'
6808'	6808'	74.33°	271.23°	6541.74'	631.78'
6859'	6859'	81.04°	271.31°	6552.61'	681.57'





3150'

3160'

0.22°

346.41°

3152.01'

93.76'

3200'

3250'

3255'

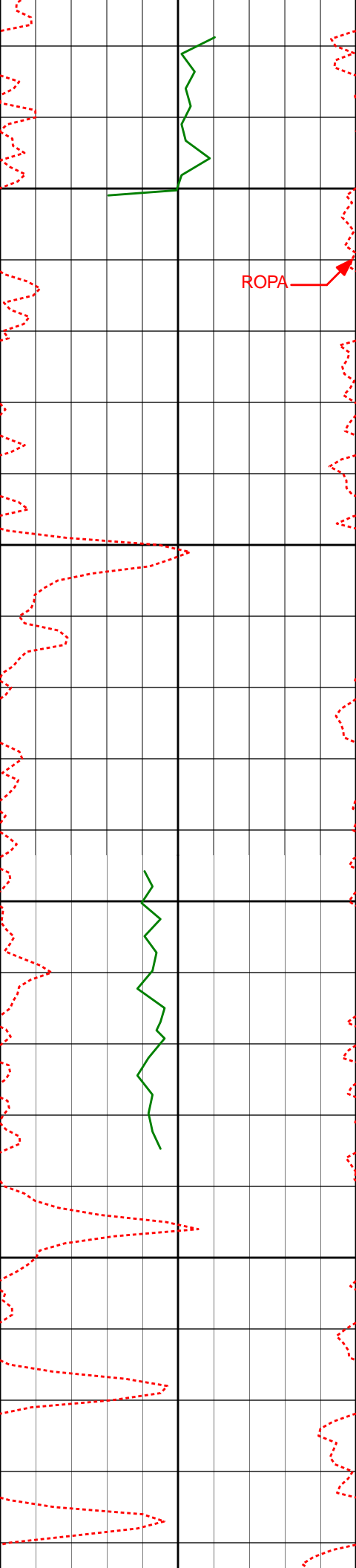
0.33°

94.67°

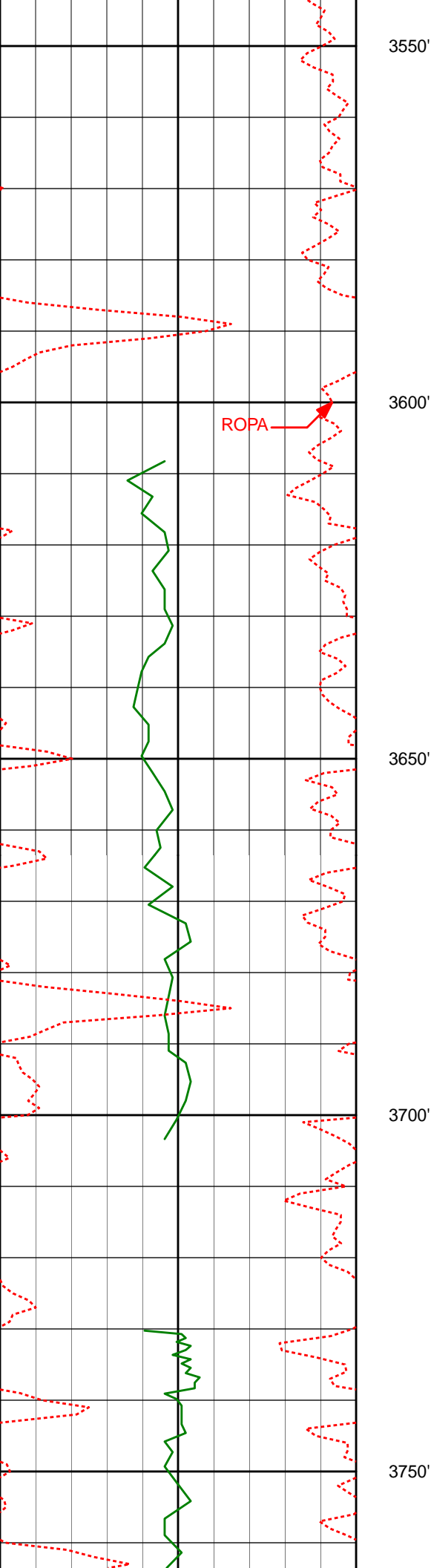
3247.01'

93.52'

3300'

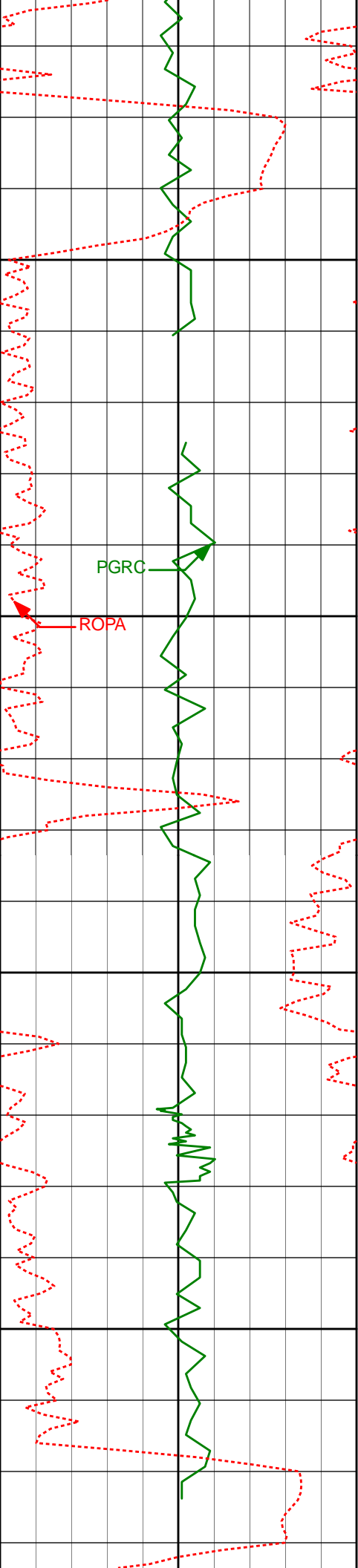


3350'	0.62°	286.56°	3342.01'	93.74'
3444'	0.47°	225.25°	3436.01'	94.50'
3539'	0.56°	193.62°	3531.00'	94.91'



3634'	0.88°	204.33°	3626.00'	95.35'
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3728'	0.77°	204.37°	3719.99'	95.95'
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3800'

3823'

0.62°

249.05°

3814.98'

96.71'

3850'

3900'

3918'

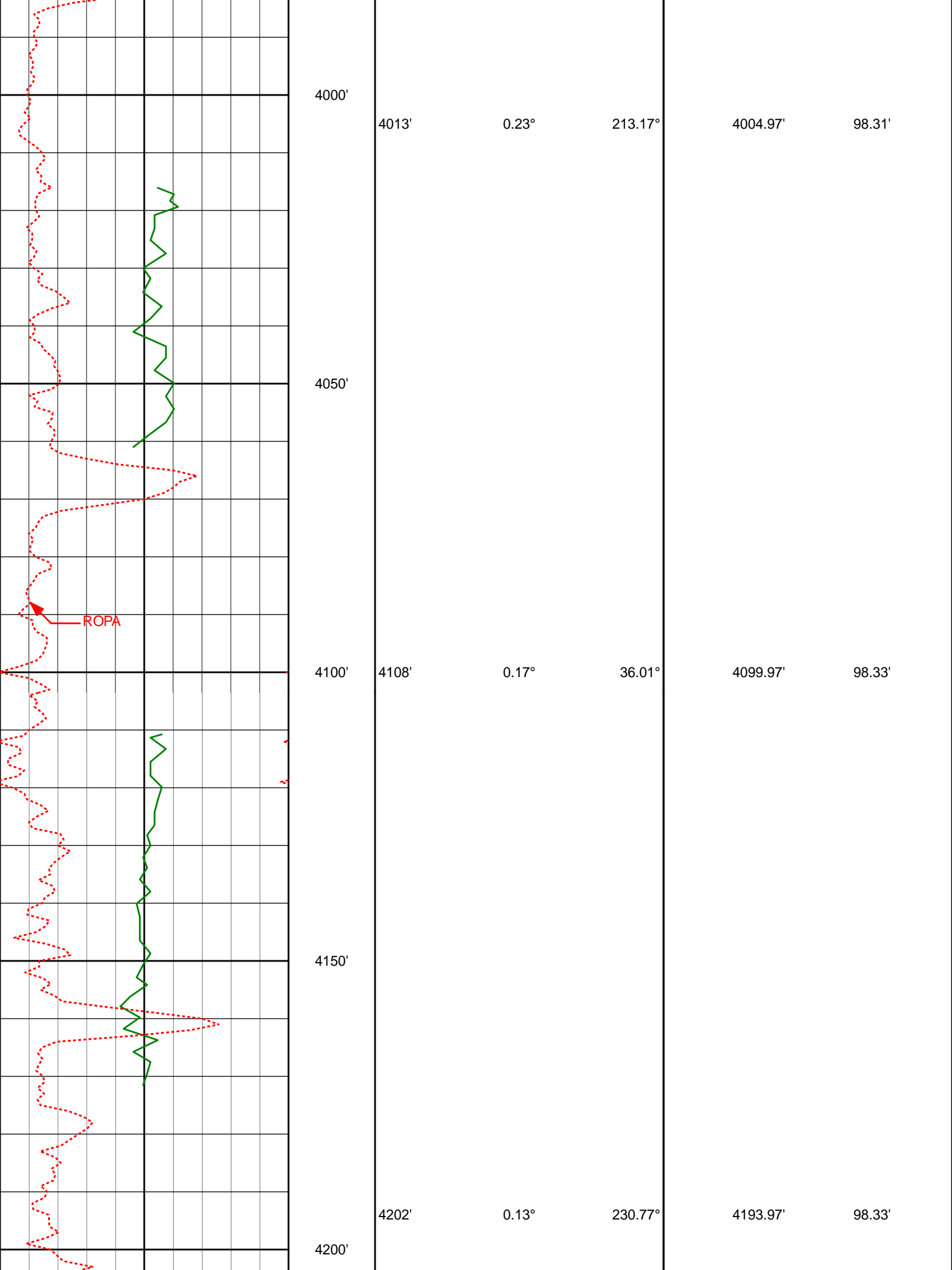
0.72°

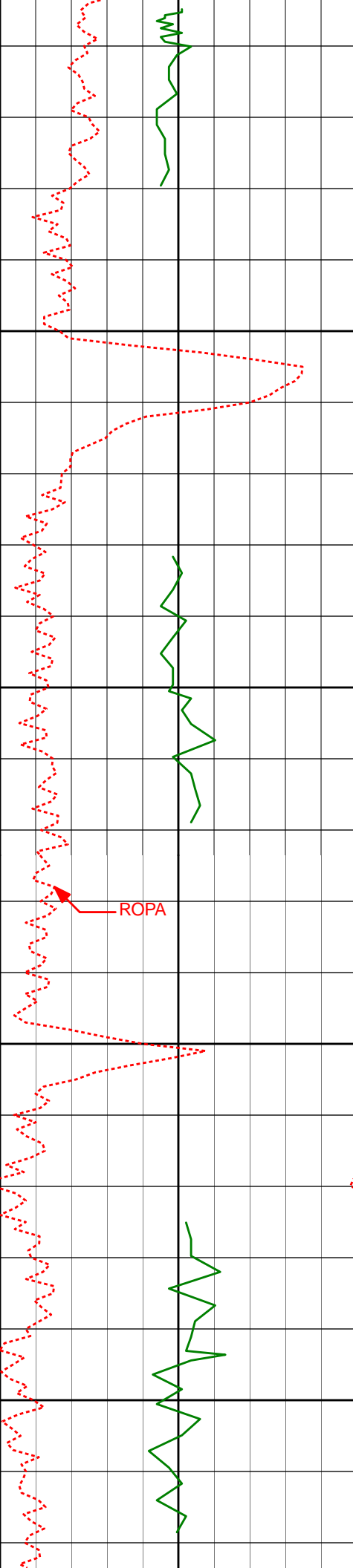
235.47°

3909.97'

97.70'

3950'





4250'

4297'

0.18°

179.46°

4288.97'

98.42'

4300'

4350'

4392'

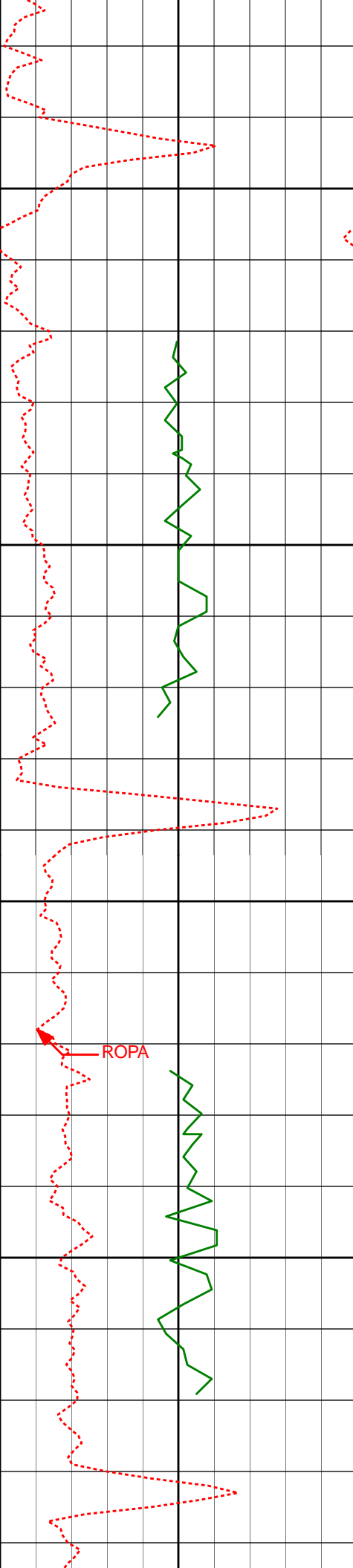
0.10°

299.47°

4383.97'

98.50'

4400'



4450'

4487'

0.28°

1.94°

4478.97'

98.55'

4500'

4550'

4582'

0.37°

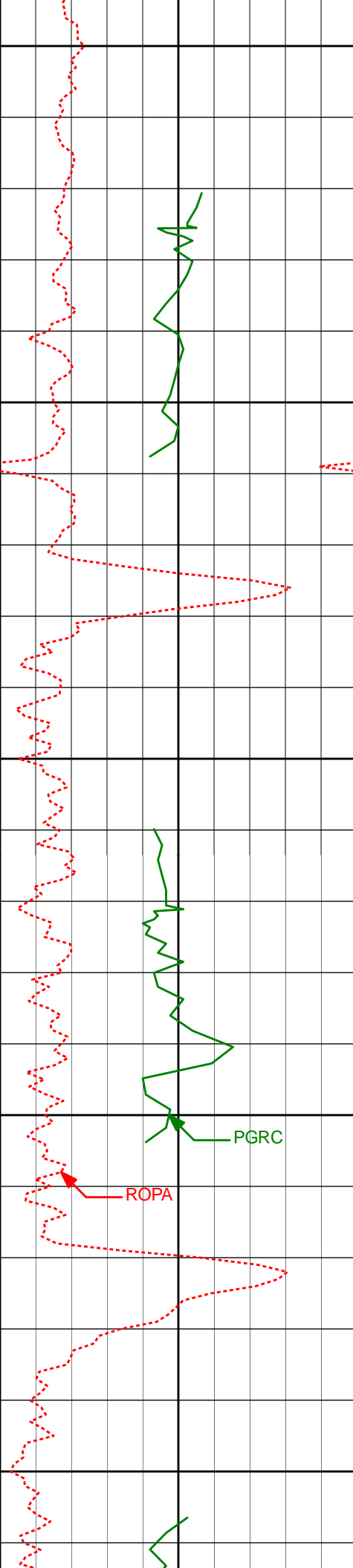
308.51°

4573.97'

98.77'

4600'

ROPA



4650'

4677'

0.63°

319.97°

4668.96'

99.33'

4700'

4750'

4771'

0.52°

301.43°

4762.96'

100.01'

4800'

ROPA

PGRC

4850'

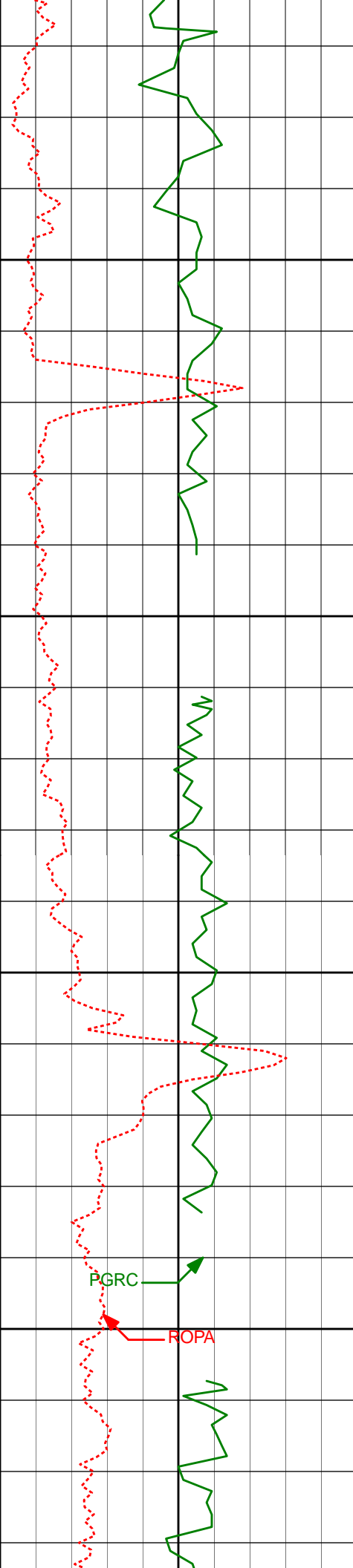
4866'

0.18°

322.68°

4857.96'

100.46'



4900'

4950'

5000'

5050'

4961'

0.13°

324.35°

4952.96'

100.60'

5056'

0.39°

299.79°

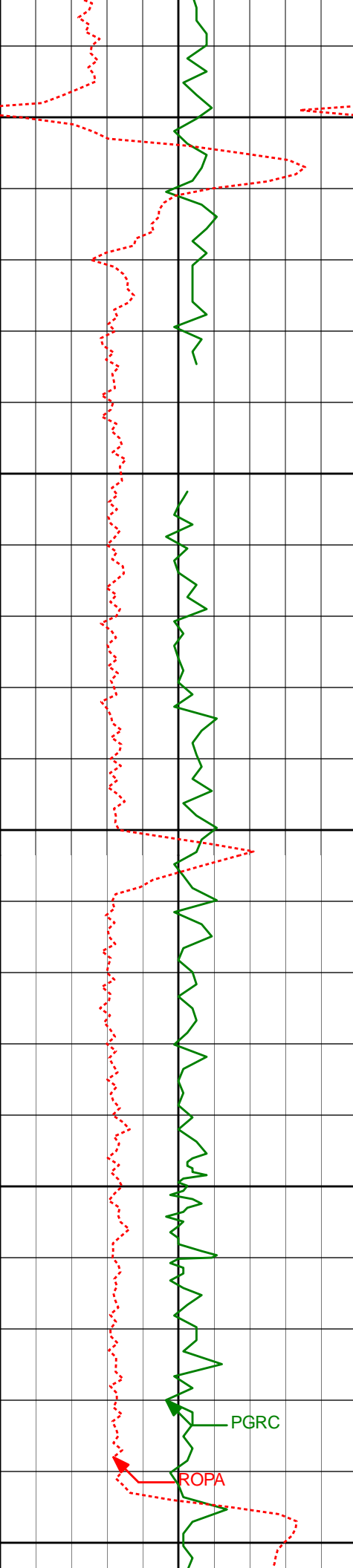
5047.96'

100.94'

PGRC

ROPA





5100'

5151'

0.80°

243.36°

5142.95'

101.82'

5150'

5200'

5246'

0.80°

265.98°

5237.94'

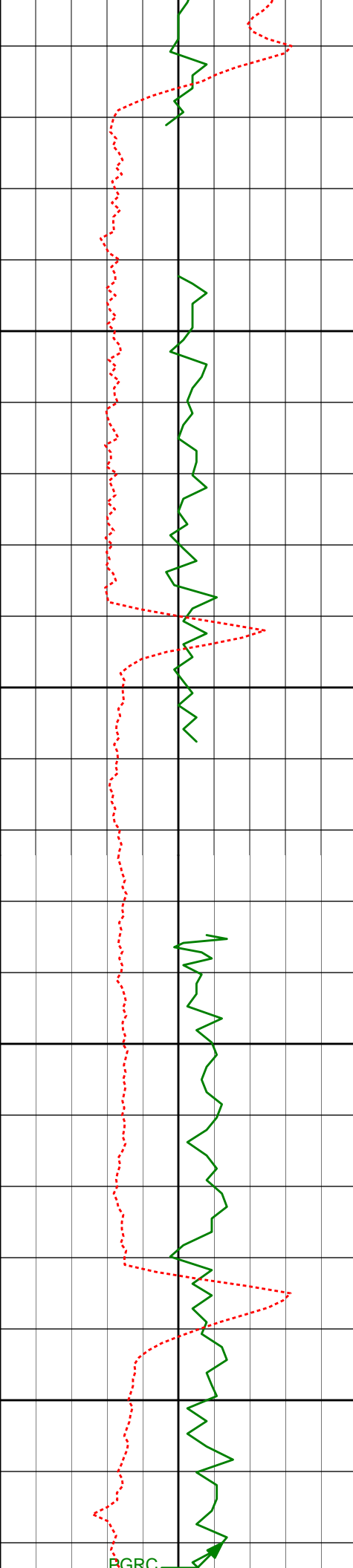
103.08'

5250'

5300'

PGRC

ROPA



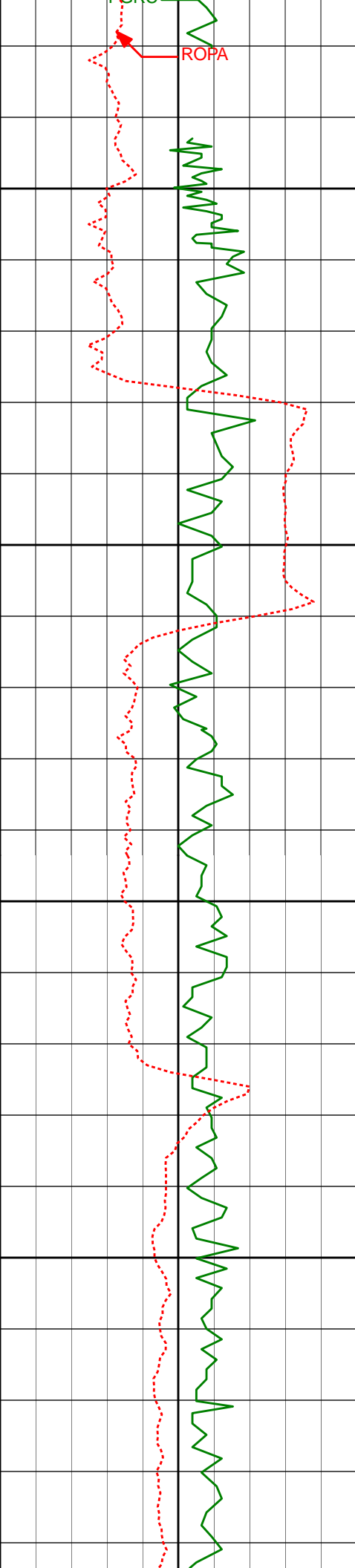
5350'

5400'

5450'

5500'

5340'	0.73°	303.58°	5331.93'	104.22'
5435'	0.89°	265.43°	5426.92'	105.45'
5530'	0.81°	288.19°	5521.91'	106.82'



5550'

5600'

5650'

5700'

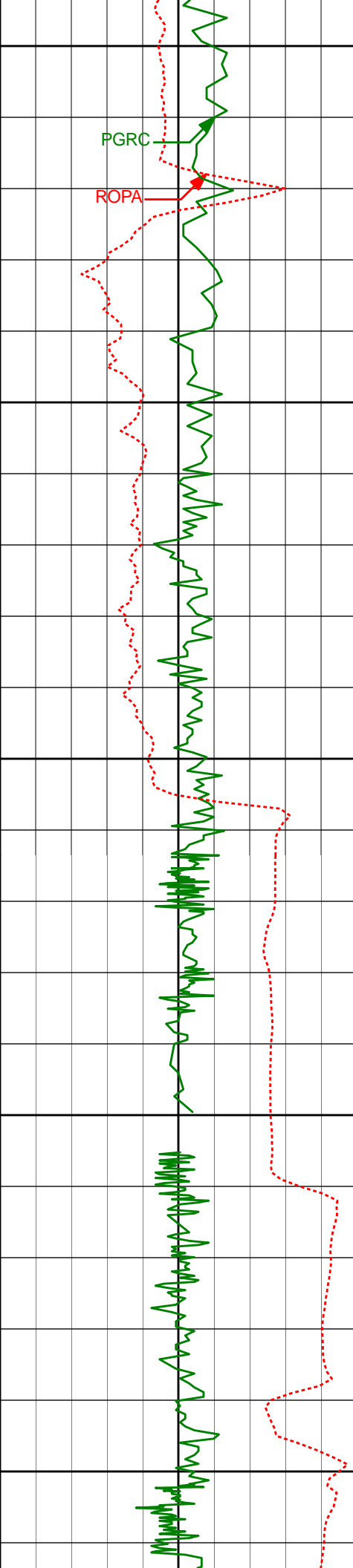
5719'

0.65°

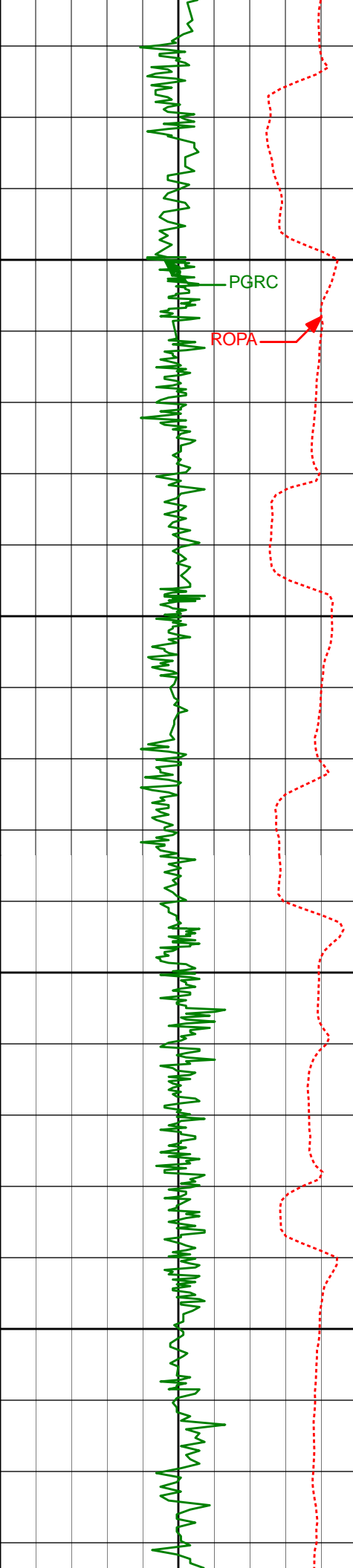
278.74°

5710.90'

109.13'



5750'				
5800'	5812'	0.86°	276.09°	5803.89'
5850'				
5900'	5907'	0.89°	287.28°	5898.88'
5950'	5955'	3.88°	270.43°	5946.83'



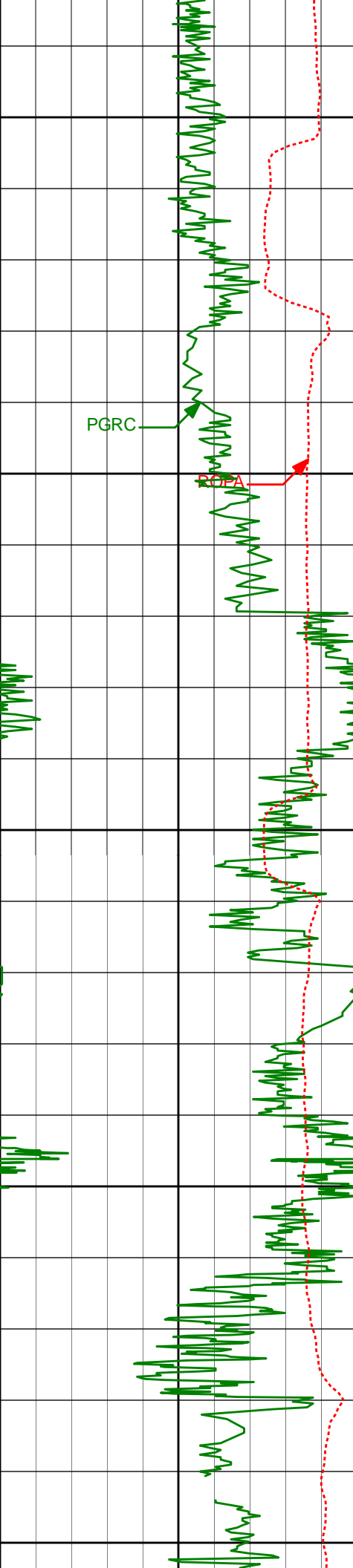
6000'

6050'

6100'

6150'

6002'	7.18°	265.40°	5993.61'	118.25'
6050'	10.67°	260.48°	6041.02'	125.64'
6097'	13.82°	264.98°	6086.95'	135.55'
6192'	22.83°	269.77°	6177.04'	165.37'



6200'

6250'

6300'

6350'

6400'

6287'

30.17°

269.82°

6262.00'

207.72'

6381'

40.49°

267.13°

6338.59'

261.99'

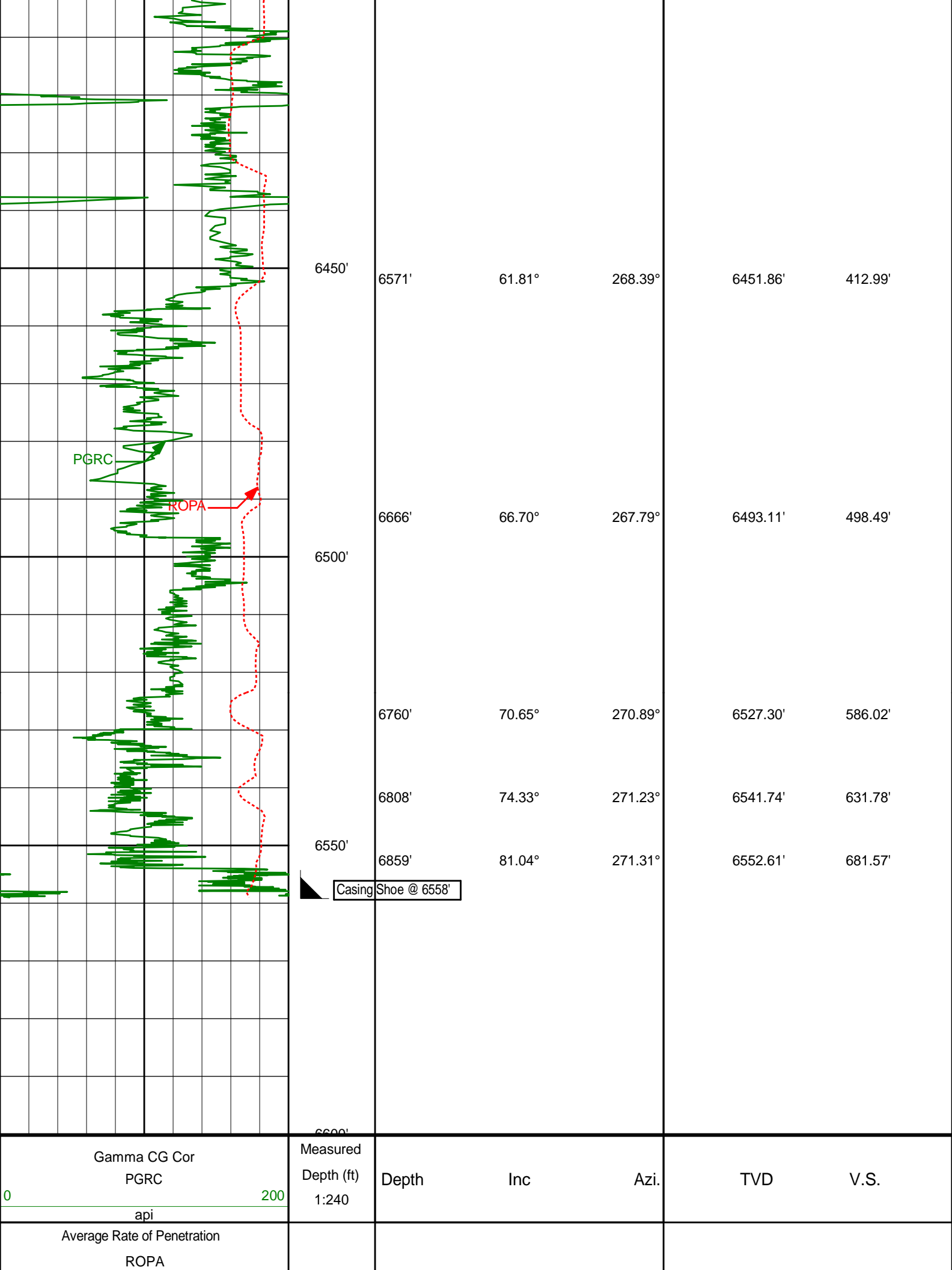
6476'

55.14°

266.62°

6402.21'

332.12'



Gamma CG Cor PGRC		Measured Depth (ft) 1:240	Depth	Inc	Azi.	TVD	V.S.
0200 api							
Average Rate of Penetration ROPA							

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Wells Ranch State AE31-69HNC
Wattenberg
Weld Colorado
USA
CA-XX-0901134791

The first two surveys at 350' and 615' are provided by HP.

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
350.00	0.40	225.37	350.00	0.86 S	0.87 W	0.90	0.11
615.00	0.60	109.37	614.99	1.97 S	0.22 W	0.28	0.32
713.00	0.55	156.65	712.99	2.57 S	0.45 E	-0.37	0.47
805.00	0.63	139.58	804.98	3.36 S	0.95 E	-0.85	0.21
898.00	0.72	125.79	897.98	4.09 S	1.76 E	-1.63	0.20
990.00	0.70	137.49	989.97	4.84 S	2.61 E	-2.45	0.16
1083.00	0.84	136.81	1082.96	5.76 S	3.46 E	-3.27	0.15
1177.00	0.72	161.98	1176.95	6.82 S	4.11 E	-3.89	0.38
1270.00	0.60	19.58	1269.95	6.92 S	4.46 E	-4.24	1.34
1455.00	0.68	358.66	1454.94	4.91 S	4.76 E	-4.60	0.13
1550.00	0.50	4.10	1549.93	3.93 S	4.77 E	-4.65	0.20
1645.00	1.56	218.47	1644.92	4.53 S	4.00 E	-3.85	2.10
1739.00	2.58	212.33	1738.86	7.32 S	2.07 E	-1.84	1.11
1834.00	4.71	218.51	1833.66	12.18 S	1.50 W	1.89	2.28
1929.00	6.06	211.85	1928.24	19.49 S	6.58 W	7.19	1.56
2023.00	7.24	215.42	2021.61	28.54 S	12.63 W	13.53	1.33
2118.00	8.32	221.00	2115.73	38.60 S	20.61 W	21.82	1.39
2213.00	8.71	221.09	2209.69	49.21 S	29.84 W	31.39	0.41
2307.00	9.04	230.20	2302.57	59.30 S	40.20 W	42.06	1.53
2402.00	7.91	231.17	2396.53	68.18 S	51.02 W	53.16	1.20
2497.00	7.12	234.93	2490.71	75.66 S	60.93 W	63.31	0.98
2592.00	6.37	233.46	2585.05	82.18 S	69.99 W	72.56	0.81
2686.00	5.69	219.46	2678.54	88.88 S	77.14 W	79.92	1.72
2781.00	4.01	236.42	2773.20	94.36 S	82.90 W	85.85	2.31
2876.00	2.41	250.37	2868.05	96.87 S	87.55 W	90.58	1.86
2971.00	0.47	288.97	2963.01	97.41 S	89.80 W	92.85	2.17
3066.00	0.31	275.03	3058.01	97.26 S	90.42 W	93.47	0.19
3160.00	0.22	346.29	3152.01	97.06 S	90.72 W	93.76	0.34
3255.00	0.33	94.55	3247.01	96.91 S	90.49 W	93.52	0.47
3350.00	0.62	286.43	3342.01	96.78 S	90.71 W	93.74	1.00
3444.00	0.47	225.13	3436.01	96.91 S	91.47 W	94.50	0.61
3539.00	0.56	193.51	3531.00	97.64 S	91.86 W	94.91	0.31
3634.00	0.88	204.21	3626.00	98.76 S	92.26 W	95.35	0.36
3728.00	0.77	204.25	3719.99	99.99 S	92.82 W	95.95	0.12
3823.00	0.62	248.92	3814.98	100.76 S	93.56 W	96.71	0.57
3918.00	0.72	235.34	3909.97	101.28 S	94.53 W	97.70	0.20
4013.00	0.23	213.05	4004.97	101.78 S	95.13 W	98.31	0.54
4108.00	0.17	35.69	4099.97	101.83 S	95.15 W	98.33	0.42
4202.00	0.13	230.84	4193.97	101.78 S	95.15 W	98.33	0.32
4297.00	0.18	179.15	4288.97	102.00 S	95.23 W	98.42	0.15
4392.00	0.10	299.18	4383.97	102.11 S	95.30 W	98.50	0.26
4487.00	0.28	1.97	4478.97	101.83 S	95.37 W	98.55	0.26
4582.00	0.37	308.47	4573.97	101.41 S	95.60 W	98.77	0.32
4677.00	0.63	319.69	4668.96	100.82 S	96.18 W	99.33	0.29
4771.00	0.52	301.11	4762.96	100.21 S	96.87 W	100.01	0.23
4866.00	0.18	322.55	4857.96	99.87 S	97.33 W	100.46	0.38
4961.00	0.13	324.27	4952.96	99.66 S	97.49 W	100.60	0.05
5056.00	0.39	299.86	5047.96	99.41 S	97.83 W	100.94	0.29
5151.00	0.80	243.21	5142.95	99.55 S	98.70 W	101.82	0.71
5246.00	0.80	266.01	5237.94	99.89 S	99.96 W	103.08	0.33
5340.00	0.73	303.62	5331.93	99.61 S	101.11 W	104.22	0.53
5435.00	0.89	265.11	5426.92	99.34 S	102.35 W	105.45	0.58

5530.00	0.81	288.06	5521.91	99.19 S	103.72 W	106.82	0.37
5719.00	0.65	278.80	5710.90	98.61 S	106.05 W	109.13	0.10
5812.00	0.86	275.94	5803.89	98.46 S	107.27 W	110.34	0.23
5907.00	0.89	287.13	5898.88	98.17 S	108.68 W	111.75	0.18
5955.00	3.88	270.20	5946.83	98.05 S	110.66 W	113.72	6.33
6002.00	7.18	265.08	5993.61	98.30 S	115.18 W	118.25	7.09
6050.00	10.67	260.01	6041.02	99.33 S	122.55 W	125.64	7.45
6097.00	13.82	264.42	6086.95	100.63 S	132.42 W	135.55	6.99
6192.00	22.83	268.98	6177.04	102.06 S	162.21 W	165.37	9.60
6287.00	30.17	268.90	6262.00	102.85 S	204.56 W	207.72	7.73
6381.00	40.49	266.19	6338.59	105.34 S	258.78 W	261.99	11.10
6476.00	55.14	265.07	6402.21	110.77 S	328.76 W	332.12	15.45
6571.00	61.81	266.84	6451.86	116.43 S	409.49 W	412.99	7.20
6666.00	66.70	266.16	6493.11	121.67 S	494.88 W	498.49	5.19
6760.00	70.65	269.19	6527.30	125.19 S	582.34 W	586.02	5.16
6808.00	74.33	269.50	6541.74	125.71 S	628.11 W	631.78	7.69
6859.00	81.04	269.55	6552.61	126.12 S	677.90 W	681.57	13.16
6946.00	87.13	270.03	6561.57	126.43 S	764.40 W	768.03	7.02
7040.00	90.99	268.80	6563.11	127.39 S	858.36 W	861.97	4.31
7135.00	89.72	268.11	6562.52	129.96 S	953.32 W	956.97	1.52
7230.00	90.09	270.00	6562.68	131.52 S	1048.30 W	1051.95	2.03
7325.00	88.77	270.16	6563.63	131.39 S	1143.30 W	1146.89	1.40
7420.00	89.72	267.84	6564.88	133.05 S	1238.27 W	1241.87	2.64
7515.00	89.23	266.83	6565.75	137.47 S	1333.16 W	1336.85	1.18
7609.00	89.32	266.50	6566.94	142.93 S	1426.99 W	1430.81	0.36
7704.00	89.11	266.63	6568.24	148.62 S	1521.81 W	1525.76	0.26
7799.00	88.61	268.32	6570.13	152.81 S	1616.70 W	1620.73	1.85
7894.00	91.02	269.59	6570.44	154.54 S	1711.67 W	1715.72	2.87
7989.00	89.04	272.65	6570.39	152.69 S	1806.64 W	1810.58	3.84
8083.00	89.29	270.34	6571.76	150.23 S	1900.59 W	1904.40	2.47
8178.00	88.12	268.67	6573.90	151.05 S	1995.56 W	1999.35	2.15
8272.00	89.57	269.84	6575.80	152.28 S	2089.52 W	2093.31	1.98
8367.00	90.80	269.84	6575.49	152.54 S	2184.52 W	2188.26	1.29
8462.00	88.21	268.47	6576.31	153.94 S	2279.50 W	2283.24	3.08
8556.00	88.92	268.85	6578.67	156.14 S	2373.44 W	2377.20	0.86
8651.00	89.51	268.32	6579.97	158.48 S	2468.40 W	2472.19	0.83
8746.00	89.75	268.59	6580.58	161.05 S	2563.37 W	2567.19	0.38
8841.00	89.48	267.89	6581.22	163.96 S	2658.32 W	2662.19	0.79
8935.00	90.74	268.69	6581.04	166.77 S	2752.27 W	2756.18	1.59
9030.00	89.48	269.02	6580.86	168.67 S	2847.25 W	2851.17	1.37
9125.00	89.63	268.56	6581.59	170.67 S	2942.23 W	2946.17	0.51
9220.00	89.38	266.54	6582.42	174.73 S	3037.13 W	3041.15	2.14
9315.00	90.96	268.32	6582.13	178.99 S	3132.03 W	3136.14	2.51
9410.00	90.71	270.26	6580.75	180.17 S	3227.01 W	3231.10	2.06
9505.00	87.90	269.18	6581.90	180.63 S	3321.99 W	3326.05	3.17
9596.00	88.30	270.01	6584.92	181.28 S	3412.94 W	3416.97	1.01
9688.00	89.14	269.54	6586.97	181.64 S	3504.91 W	3508.91	1.05
9781.00	89.88	269.25	6587.77	182.62 S	3597.90 W	3601.89	0.85
9873.00	88.52	267.11	6589.05	185.54 S	3689.84 W	3693.87	2.76
9966.00	88.43	268.29	6591.53	189.27 S	3782.73 W	3786.83	1.27
10059.00	89.88	268.50	6592.90	191.88 S	3875.68 W	3879.82	1.58
10151.00	90.99	269.31	6592.20	193.64 S	3967.66 W	3971.81	1.49
10243.00	89.91	270.19	6591.48	194.04 S	4059.65 W	4063.77	1.51
10335.00	89.41	268.82	6592.03	194.83 S	4151.65 W	4155.74	1.59
10428.00	89.57	266.66	6592.85	198.50 S	4244.56 W	4248.73	2.33
10521.00	89.54	267.24	6593.58	203.45 S	4337.43 W	4341.70	0.62
10614.00	90.28	268.55	6593.72	206.86 S	4430.36 W	4434.70	1.62
10708.00	88.49	268.97	6594.73	208.90 S	4524.33 W	4528.68	1.96
10801.00	90.37	269.97	6595.66	209.76 S	4617.32 W	4621.65	2.29
10894.00	91.20	270.77	6594.38	209.16 S	4710.31 W	4714.57	1.24
10986.00	89.48	270.54	6593.84	208.11 S	4802.29 W	4806.48	1.89
11078.00	89.78	268.42	6594.43	208.94 S	4894.28 W	4898.45	2.33
11172.00	89.91	266.79	6594.68	212.87 S	4988.20 W	4992.44	1.74
11267.00	89.63	267.65	6595.07	217.48 S	5083.08 W	5087.43	0.95
11361.00	89.57	268.38	6595.72	220.73 S	5177.03 W	5181.42	0.78
11455.00	90.03	268.44	6596.05	223.34 S	5270.99 W	5275.42	0.49
11550.00	89.75	269.20	6596.23	225.30 S	5365.97 W	5370.42	0.85
11644.00	89.41	270.73	6596.92	225.35 S	5459.96 W	5464.36	1.67
11739.00	90.15	270.72	6597.29	224.15 S	5554.95 W	5559.27	0.78
11833.00	89.08	272.27	6597.92	221.70 S	5648.91 W	5653.11	2.00
11927.00	87.84	269.30	6600.44	220.41 S	5742.86 W	5746.96	3.42
12022.00	87.81	269.12	6604.05	221.72 S	5837.78 W	5841.88	0.19
12116.00	88.40	269.05	6607.16	223.22 S	5931.72 W	5935.81	0.63
12211.00	88.52	267.53	6609.71	226.06 S	6026.64 W	6030.78	1.60
12306.00	89.56	268.48	6612.51	228.82 S	6121.52 W	6125.77	2.18

12306.00	90.52	268.10	6610.51	229.68 S	6121.56 W	6125.77	2.19
12401.00	90.28	268.13	6609.84	232.80 S	6216.51 W	6220.76	0.25
12495.00	90.03	267.73	6609.59	236.20 S	6310.44 W	6314.76	0.50
12589.00	89.88	267.38	6609.66	240.21 S	6404.36 W	6408.76	0.41
12684.00	90.62	266.87	6609.25	244.97 S	6499.24 W	6503.74	0.95
12779.00	89.63	267.86	6609.04	249.34 S	6594.13 W	6598.73	1.47
12874.00	89.32	267.97	6609.91	252.80 S	6689.07 W	6693.72	0.35
12969.00	89.63	269.54	6610.78	254.86 S	6784.04 W	6788.71	1.68
13064.00	89.45	269.49	6611.55	255.66 S	6879.03 W	6883.68	0.20
13159.00	89.29	268.93	6612.59	256.97 S	6974.02 W	6978.66	0.61
13254.00	89.48	268.73	6613.61	258.91 S	7068.99 W	7073.65	0.29
13349.00	90.03	268.74	6614.02	261.01 S	7163.97 W	7168.64	0.58
13443.00	89.97	267.96	6614.02	263.72 S	7257.93 W	7262.64	0.83
13538.00	90.22	267.58	6613.86	267.41 S	7352.85 W	7357.64	0.48
13633.00	89.88	267.90	6613.78	271.16 S	7447.78 W	7452.64	0.49
13728.00	89.26	267.49	6614.49	274.98 S	7542.70 W	7547.63	0.78
13823.00	89.05	268.43	6615.89	278.36 S	7637.63 W	7642.62	1.01
13918.00	89.14	267.29	6617.39	281.91 S	7732.55 W	7737.60	1.20
14013.00	88.27	265.34	6619.54	288.01 S	7827.32 W	7832.52	2.25
14107.00	90.28	266.47	6620.73	294.72 S	7921.07 W	7926.43	2.45
14202.00	90.86	267.48	6619.78	299.74 S	8015.93 W	8021.41	1.23
14297.00	90.80	269.50	6618.41	302.24 S	8110.88 W	8116.39	2.13
14392.00	91.14	268.46	6616.80	303.93 S	8205.85 W	8211.37	1.15
14487.00	91.57	268.35	6614.55	306.58 S	8300.79 W	8306.34	0.47
14582.00	91.11	269.64	6612.33	308.24 S	8395.75 W	8401.30	1.44
14676.00	91.11	269.41	6610.51	309.02 S	8489.72 W	8495.26	0.24
14771.00	90.34	270.73	6609.31	308.90 S	8584.71 W	8590.19	1.61
14866.00	90.59	270.41	6608.54	307.96 S	8679.71 W	8685.11	0.43
14961.00	90.93	269.88	6607.28	307.72 S	8774.70 W	8780.04	0.66
15056.00	91.48	269.31	6605.28	308.39 S	8869.67 W	8874.99	0.83
15151.00	90.96	270.03	6603.26	308.94 S	8964.65 W	8969.94	0.93
15278.00	91.54	269.86	6600.49	309.06 S	9091.62 W	9096.85	0.48
15344.00	91.54	269.86	6598.71	309.22 S	9157.59 W	9162.79	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 268.18 DEGREES (GRID)
A TOTAL CORRECTION OF 7.57 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 15344.00 FEET
IS 9162.81 FEET ALONG 268.07 DEGREES (GRID)**

Final survey is a straight line projection to TD.