HALLIBURTON | Sperry Drilling

PCGK : Pressure Case Gamma
PCDC: Pressure Case Directional

Powered by INSITE™

1 : 600 / 1 : 240

Company	**Noble Energy**
Rig	**H&P 315**
Well	**Fiscus Federal LD23-78HN**
Field	**Wildcat**
Country	**USA**
API Number	**0512337070**

Country	**USA**
Field	**Wildcat**
Location	**Lat: 40°43' 49.26" North Long: 103°50' 17.97" West**
Well	**Fiscus Federal LD23-78HN**
Company	**Noble Energy**
Rig	**H&P 315**

LOCATION

Latitude : **40°43' 49.26" North**
Longitude : **103°50' 17.97" West**

UTM Easting = **3,460,511.499 ft**
UTM Northing = **1,513,225.767 ft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level** Elevation : **4779.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

MD LOG

Elev. KB **N/A**
DF **4803.00 ft**
GL **4779.00 ft**
WD **N/A**

Depth Logged : **604.00 ft** To **10,037.00 ft**
Date Logged : **15-Sep-13** To **22-Sep-13**
Total Depth MD : **10,037.00 ft** TVD : **5,688.45 ft**
Spud Date : **15-Sep-13**

Unit No. : **11610113** Job No. : **CA-XX-0900735955**

Plot Type : **Final**
Plot Date : **22-Sep-13**

Run No.	Borehole Record (MD) Size	From	To
2	8.750 in	604.00 ft	5,025.00 ft
3	8.750 in	5,025.00 ft	6,045.00 ft
4	6.125 in	6,045.00 ft	10,037.00 ft

Run No.	Borehole Record (MD) Size	From	To

Casing Record (MD)

Size	Weight	From	To
7.000 in	26.00 lbpf	SURFACE	6,040.00 ft

WELL INFORMATION

MWD Run Number	100	200	300
Date run completed	18-Sep-13	19-Sep-13	22-Sep-13
Rig Bit Number	2	3	4
Bit Size (in)	8.750	8.750	6.125
Tool Nominal OD (in)	6.750	6.750	4.750
Log Start Depth (MD, ft)	604.00	5,027.00	6,045.00
Log End Depth (MD, ft)	5,027.00	6,045.00	10,037.00
Drill or Wipe	Drill	Drill	Drill
Drill/Wipe Start Date and Time	17-Sep-13 08:00	18-Sep-13 11:30	20-Sep-13 08:40
Drill/Wipe End Date and Time	18-Sep-13 00:30	19-Sep-13 01:00	21-Sep-13 21:15
Min Inc (deg) @ Depth (MD, ft)	.10 @ 1,179.00	.62 @ 5,040.00	83.60 @ 6,090.00
Max Inc (deg) @ Depth (MD, ft)	10.78 @ 2,691.00	79.17 @ 5,991.00	93.30 @ 7,605.00
Bit TFA(in2) / Bit Type	.75 / PDC	.75 / PDC	.75 / PDC
Flow Rate (gpm)	568.38	595.00	278.00
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel
Density (ppg) / Viscosity (spqt)	9.20 / 36.00	10.50 / 40.00	10.10 / 37.00
Filtrate CL (ppm)	1,600.00	1,600.00	1,600.00
pH / Fluid Loss (mptm)	8.90 / 0	8.80 / 0	9.50 / 0
PV (cP) / YP (lhf2)	10 / 11.00	13 / 12.00	10 / 8.00
% Solids / % Sand	5.20 / 0.25	8.9 / .25	9.10 / 0.25
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A

Max Tool Temp (degF) / Source	135.45 / PCM	163.20 / PCM	210.31 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Paul Kock	Paul Kock	Paul Kock		
Customer Representative	Bryant Dear	Bryant Dear	Martin Suarez		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.84	5.84	5.84		
Sub Serial Number	11341322	11303516	11698963		
Insert Serial Number	12001059	12001059	11145523		
Date and Time Initialized	16-Sep-13 13:59	18-Sep-13 05:37	19-Sep-13 21:38		
Date and Time Read	18-Sep-13 05:02	19-Sep-13 07:53	22-Sep-13 08:32		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	54.57	52.44	59.77		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11341322	11303516	11698963		
Sonde Serial Number	11062040	11062040	11902172		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	135.77	247.10	273.78		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	49.57	47.44	54.79		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11341322	11303516	11698963		
Insert/Sonde Serial Number	12071284	12071284	11292601		

REMARKS

1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.

2. No depth corrections have been made for pipe stretch or compression.

3. All data presented is recorded (memory data) unless otherwise stated.
- ROPA: Average Rate of Penetration is real time data.
- PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.

4. The following smoothing parameters have been applied to the data:
- All 2" (1:600) logs - 1 ft. interval, 3 ft. coercion distance.
- All 5" (1:240) logs - .5 ft. interval, .6 ft. coercion distance.

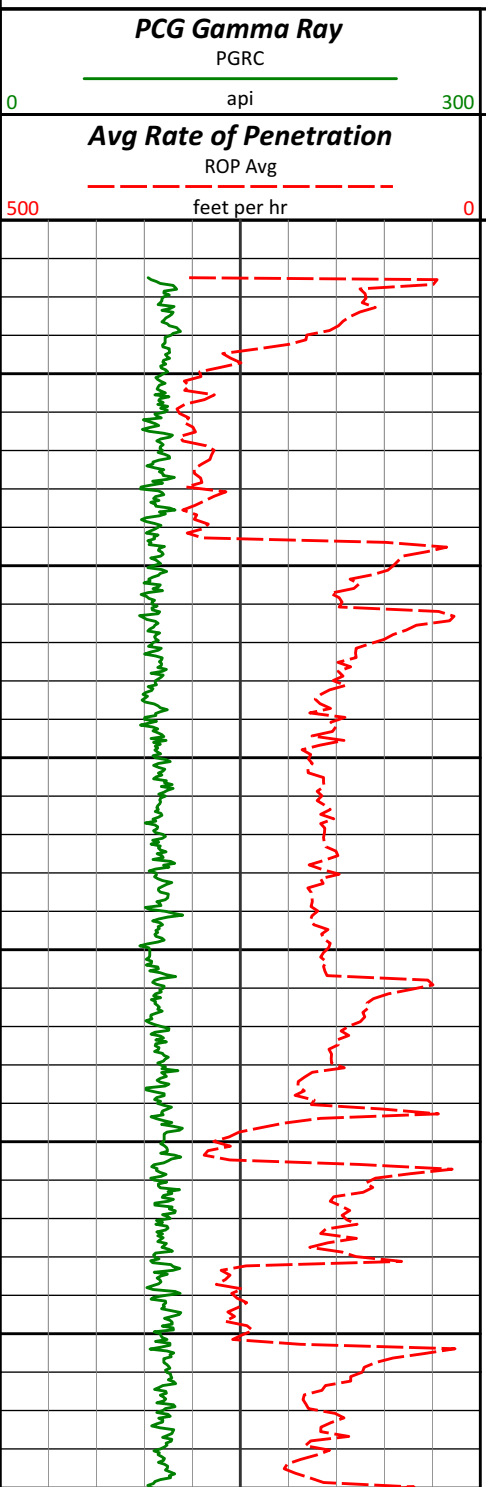
5. INSITE version 7.4.2

WARRANTY

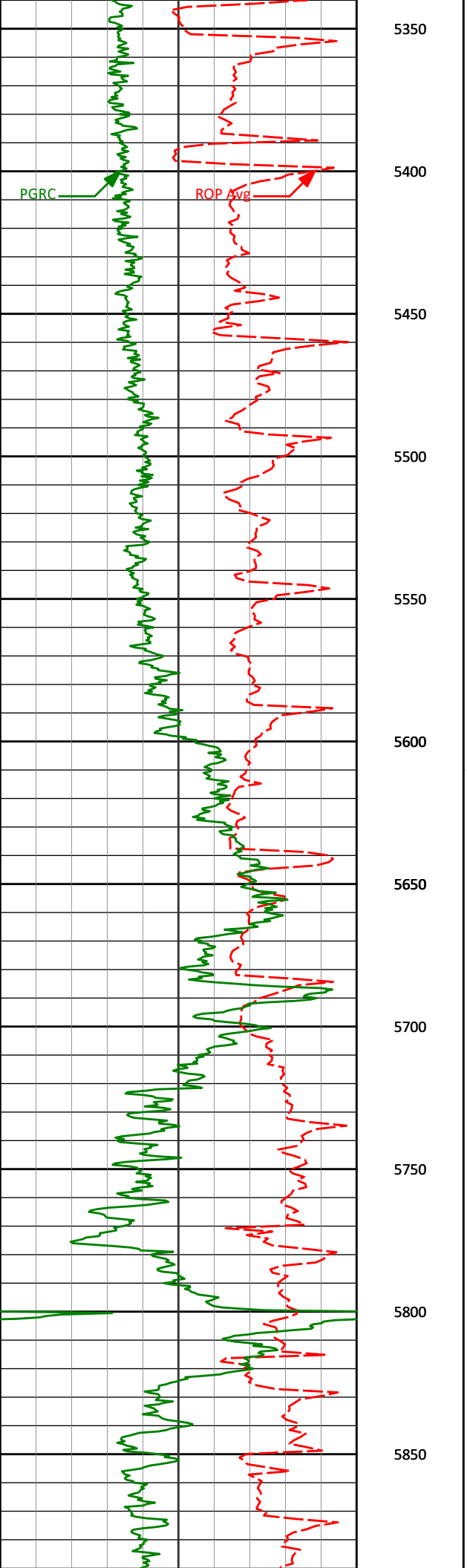
HALLIBURTON
Sperry Drilling Services

MD Main Log 1:600

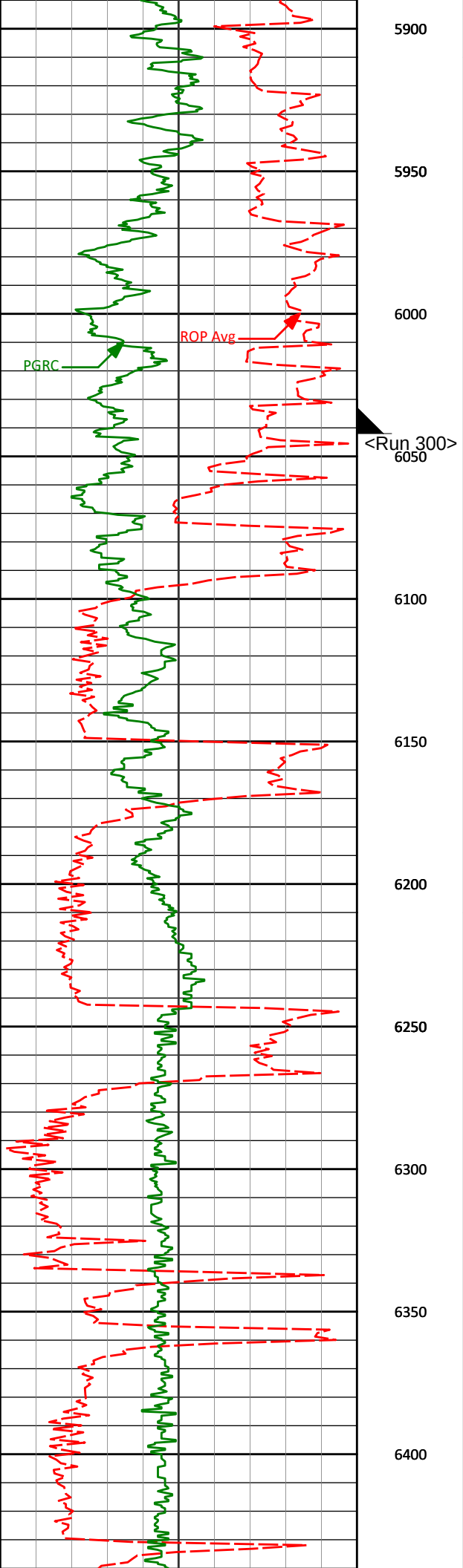
Noble Energy, Inc
Fiscus Federal LD23-78HN
H&P 315
T9N R58W



Depth ft	Depth	Inc.	Azi.	TVD	V.S.
<Run 200>					
	5040'	0.62°	328.54°	5023.56'	-222.90'
5050					
<KOP>					
5100					
5150	5156'	7.96°	339.54°	5139.15'	-214.82'
5200	5204'	15.39°	344.43°	5186.13'	-205.54'
5250	5251'	19.63°	342.99°	5230.94'	-191.97'
5300	5299'	21.80°	341.63°	5275.83'	-175.77'



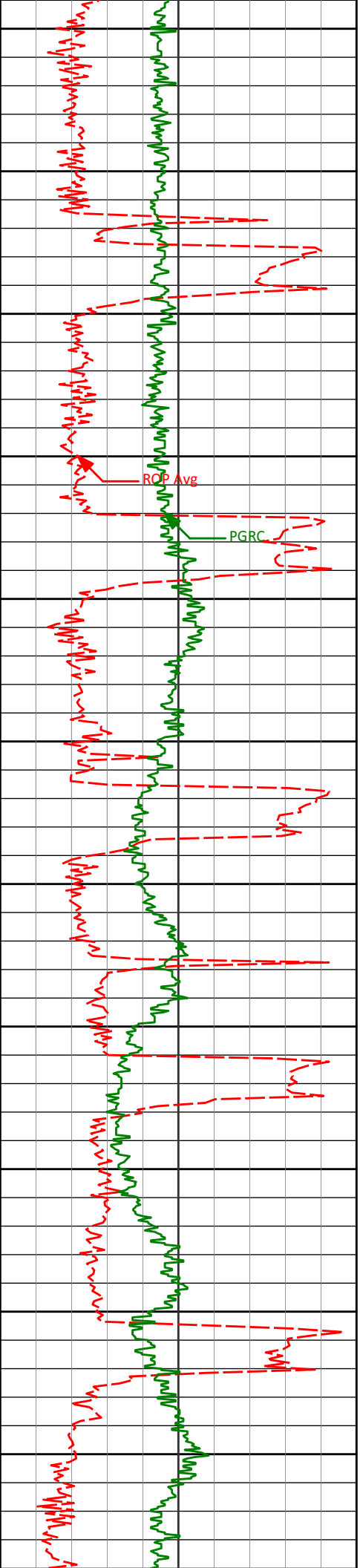
5345'	24.54°	342.99°	5318.12'	-158.51'
5393'	27.59°	346.16°	5361.23'	-138.15'
5440'	31.52°	346.11°	5402.11'	-115.63'
5488'	36.60°	347.15°	5441.86'	-89.45'
5535'	40.43°	348.81°	5478.63'	-60.81'
5583'	44.57°	352.80°	5514.02'	-28.79'
5630'	48.30°	355.67°	5546.40'	5.10'
5678'	52.35°	359.03°	5577.04'	42.00'
5725'	57.18°	2.13°	5604.15'	80.37'
5773'	62.58°	2.60°	5628.23'	121.83'
5820'	67.19°	3.51°	5648.17'	164.30'
5868'	70.09°	3.30°	5665.65'	208.91'



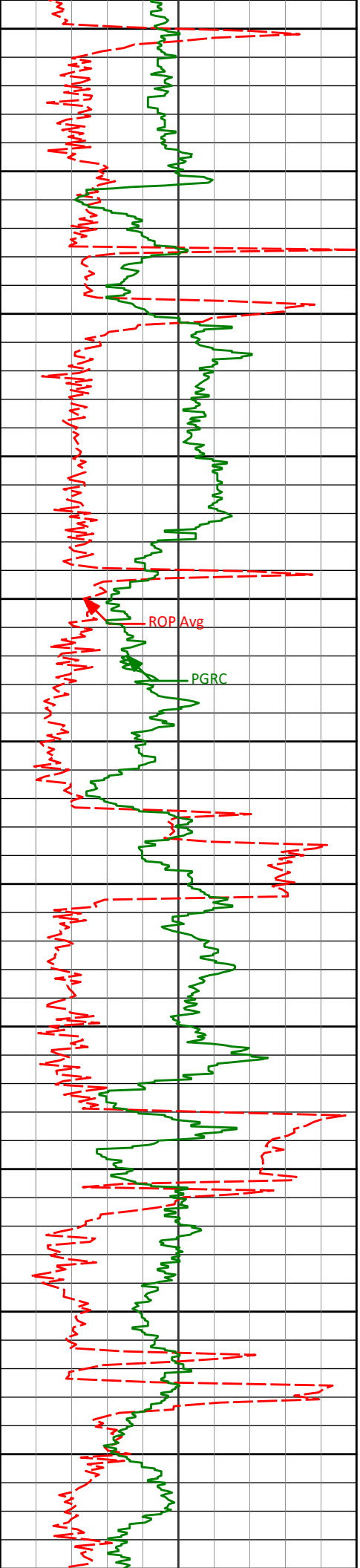
5915'	72.68°	1.22°	5680.66'	253.40'
5963'	76.04°	0.52°	5693.60'	299.61'
5991'	79.17°	359.59°	5699.61'	326.96'

<7" casing set at 6040' MD>

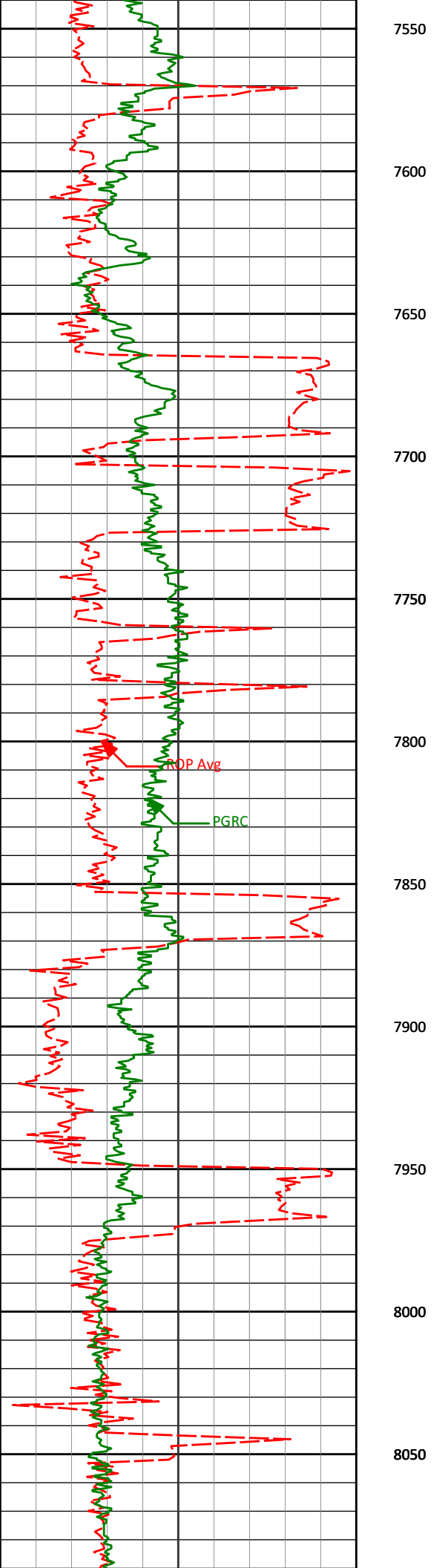
6090'	83.60°	359.67°	5714.43'	424.81'
6183'	85.90°	0.59°	5722.94'	517.41'
6276'	89.04°	1.26°	5727.04'	610.29'
6371'	90.00°	0.67°	5727.83'	705.27'



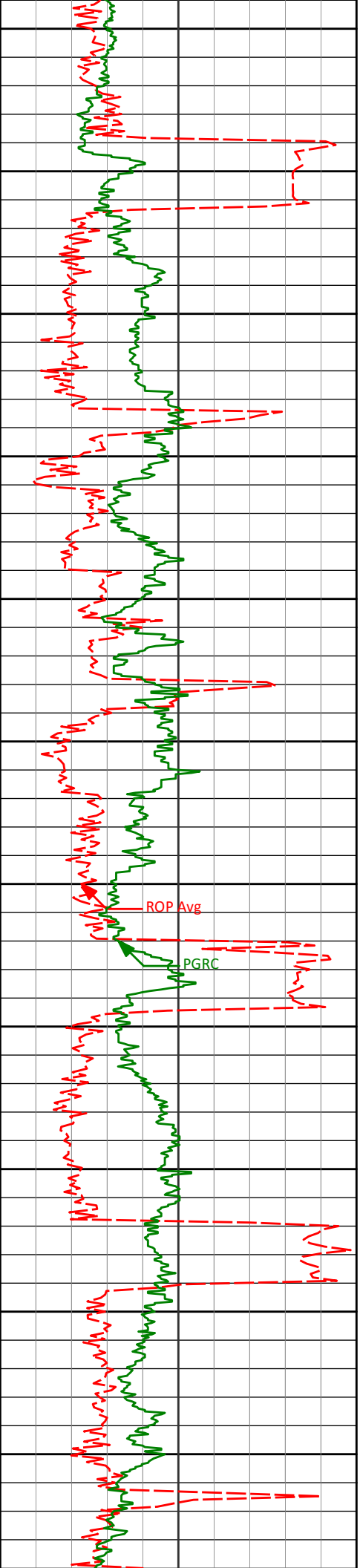
6466'	90.31°	359.62°	5727.58'	800.26'
6561'	90.89°	359.76°	5726.58'	895.26'
6656'	92.62°	1.86°	5723.67'	990.19'
6751'	92.06°	2.30°	5719.79'	1085.03'
6845'	90.99°	1.06°	5717.28'	1178.95'
6940'	89.54°	1.11°	5716.85'	1273.92'



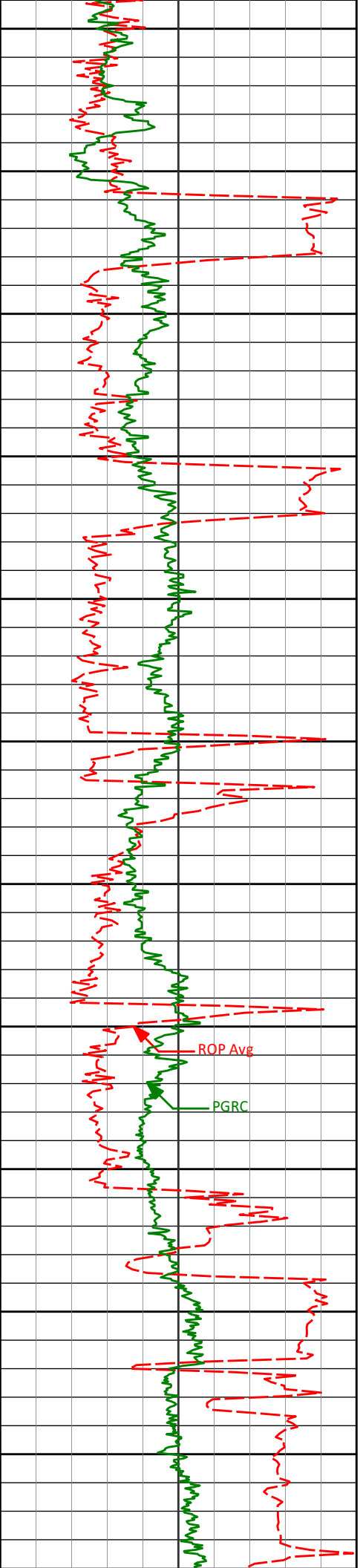
7035'	89.60°	0.84°	5717.57'	1368.89'
7130'	89.85°	1.07°	5718.03'	1463.87'
7225'	91.45°	0.66°	5716.95'	1558.85'
7320'	91.42°	359.04°	5714.58'	1653.81'
7415'	91.11°	359.07°	5712.48'	1748.78'
7510'	91.39°	358.44°	5710.41'	1843.74'



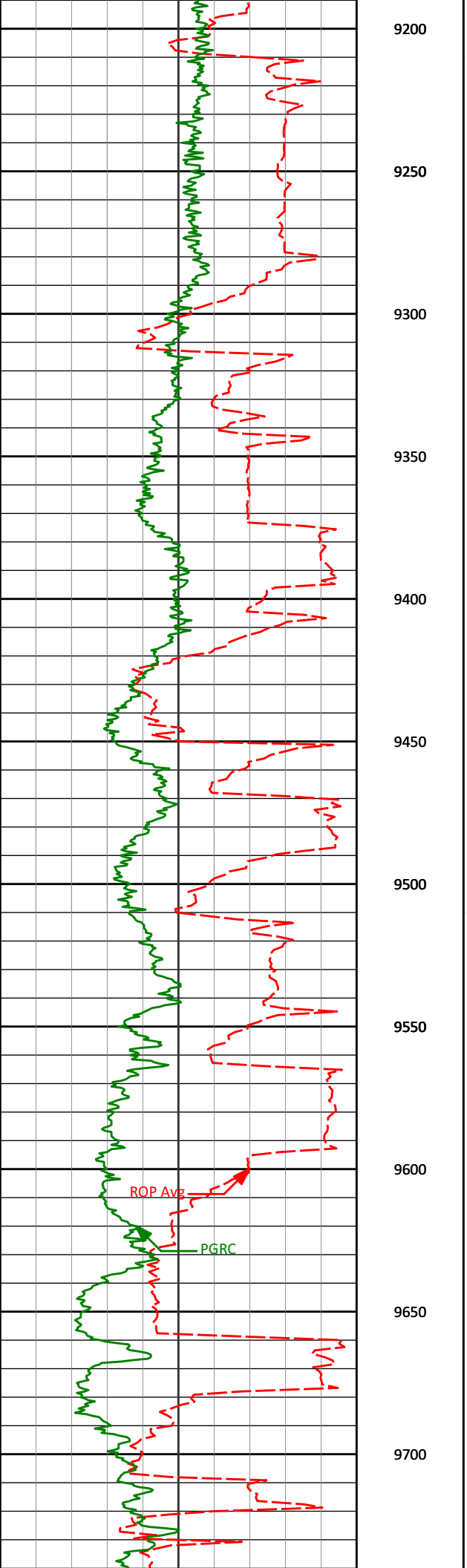
7605'	93.30°	358.24°	5706.52'	1938.63'
7699'	90.96°	358.86°	5703.04'	2032.54'
7794'	89.88°	358.44°	5702.34'	2127.51'
7889'	89.26°	357.60°	5703.06'	2222.46'
7984'	88.86°	358.61°	5704.62'	2317.41'
8079'	91.02°	359.22°	5704.72'	2412.39'



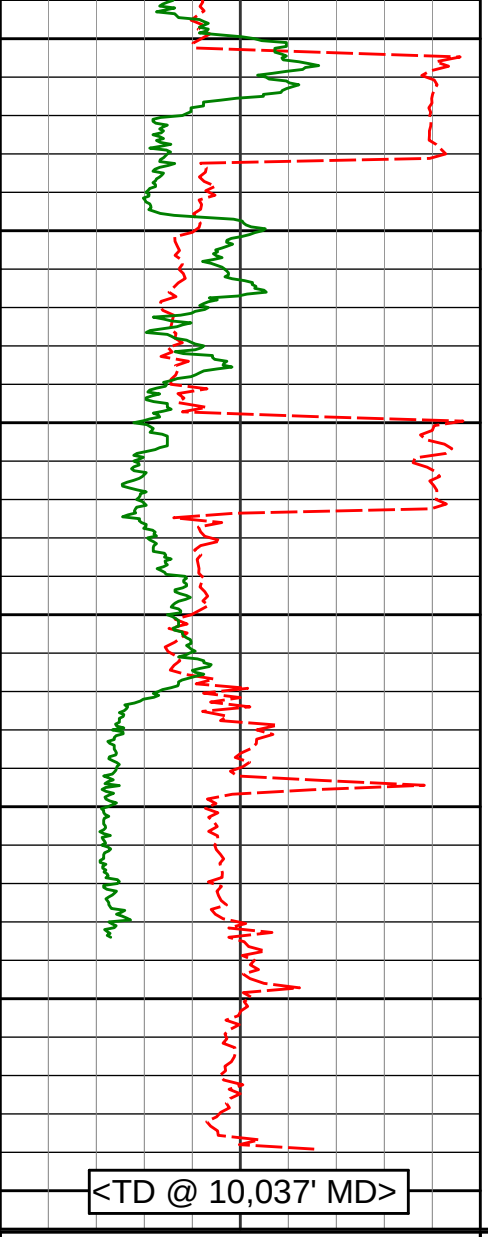
8174'	89.20°	358.08°	5704.54'	2507.37'
8269'	89.54°	357.00°	5705.59'	2602.29'
8363'	91.20°	357.00°	5704.98'	2696.17'
8458'	90.77°	358.51°	5703.34'	2791.10'
8553'	89.81°	358.35°	5702.86'	2886.07'



8648'	91.63°	359.08°	5701.65'	2981.04'
8743'	90.74°	359.26°	5699.69'	3076.01'
8838'	89.23°	358.63°	5699.71'	3171.00'
8933'	89.32°	359.24°	5700.91'	3265.98'
9028'	88.74°	358.07°	5702.52'	3360.95'
9122'	89.78°	359.91°	5703.74'	3454.92'



9218'	90.52°	358.19°	5703.48'	3550.91'
9313'	91.76°	356.97°	5701.59'	3645.82'
9407'	91.51°	359.14°	5698.90'	3739.73'
9502'	92.04°	0.39°	5695.96'	3834.68'
9597'	90.93°	1.36°	5693.51'	3929.63'
9692'	91.23°	2.23°	5691.72'	4024.56'



Depth ft	Depth	Inc.	Azi.	TVD	V.S.
9750					
	9787'	90.43°	1.12°	5690.34'	4119.49'
9800					
9850					
	9882'	89.72°	0.12°	5690.21'	4214.48'
9900					
9950					
	9975'	91.05°	0.40°	5689.58'	4307.47'
10000					
	10037'	91.05°	0.40°	5688.45'	4369.46'
10050					

Avg Rate of Penetration
ROP Avg
500 feet per hr 0

PCG Gamma Ray
PGRC
0 api 300

HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

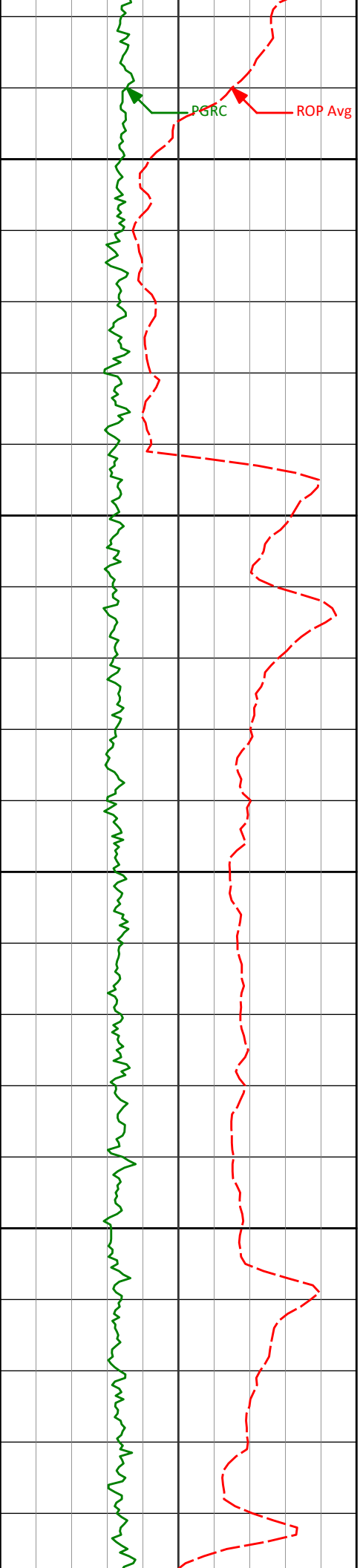
Noble Energy, Inc
Fiscus Federal LD23-78HN
H&P 315
T9N R58W

PCG Gamma Ray
PGRC
0 api 300

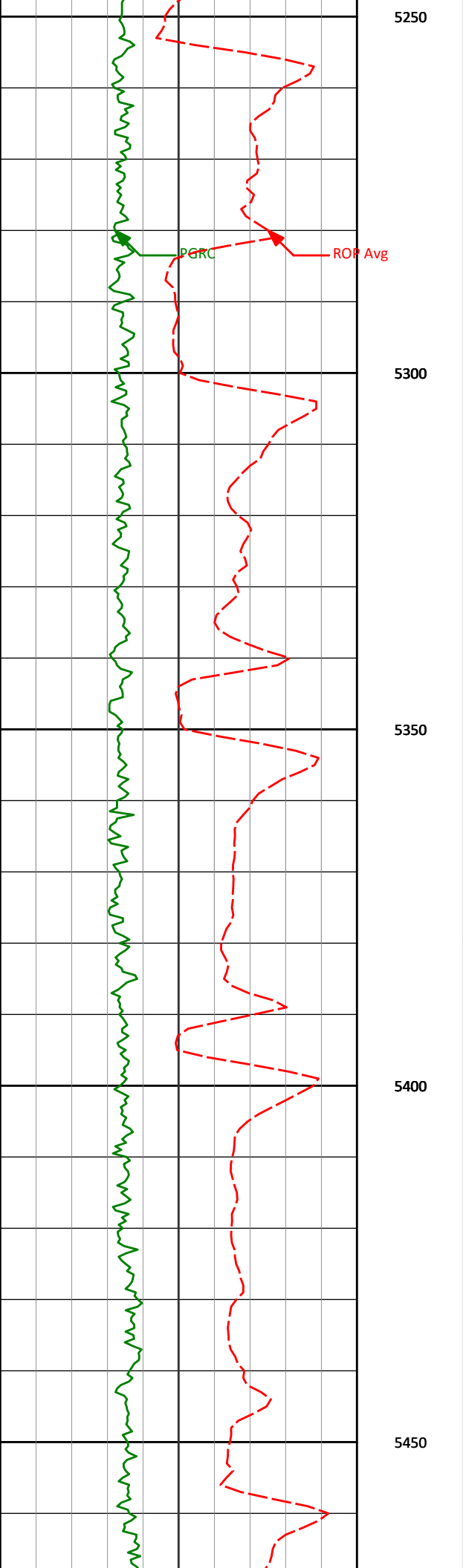
Avg Rate of Penetration
ROP Avg
500 feet per hr 0

Depth ft | Depth | Inc. | Azi. | TVD | V.S.

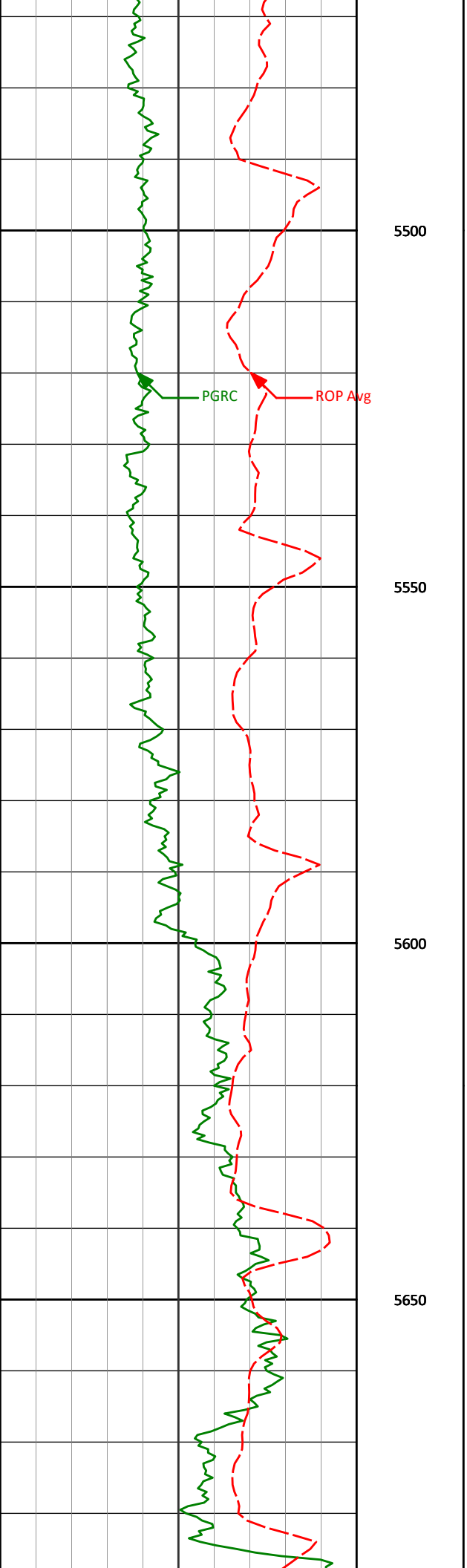
<Run 200>



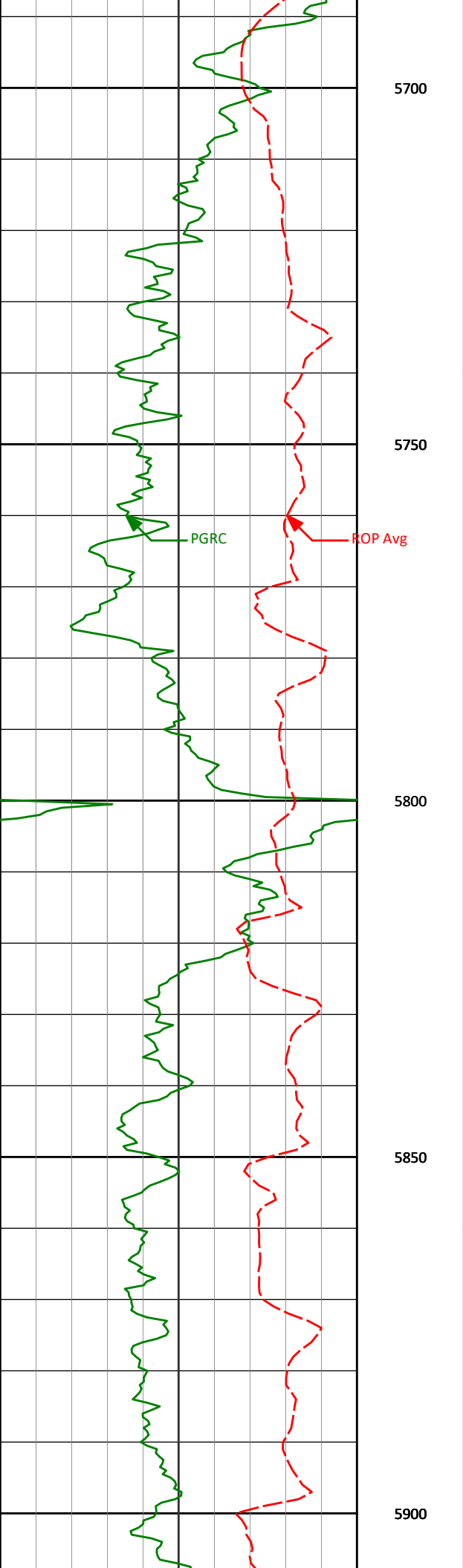
5040'	0.62°	328.54°	5023.56'	-222.90'
5156'	7.96°	339.54°	5139.15'	-214.82'
5204'	15.39°	344.43°	5186.13'	-205.54'



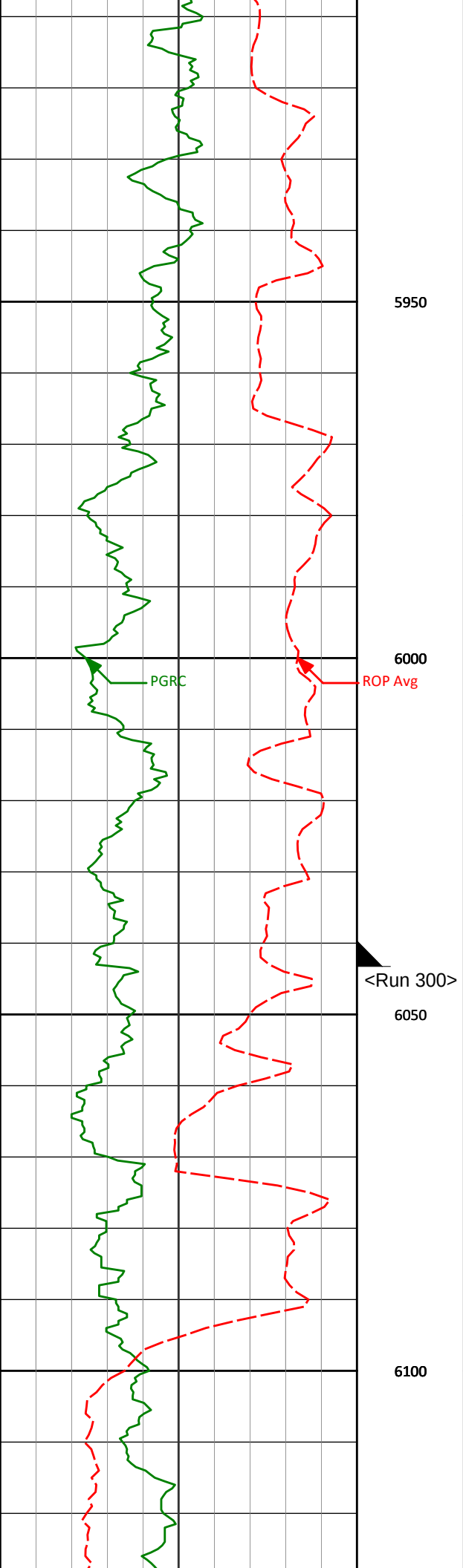
5251'	19.63°	342.99°	5230.94'	-191.97'
5299'	21.80°	341.63°	5275.83'	-175.77'
5345'	24.54°	342.99°	5318.12'	-158.51'
5393'	27.59°	346.16°	5361.23'	-138.15'
5440'	31.52°	346.11°	5402.11'	-115.63'



5488'	36.60°	347.15°	5441.86'	-89.45'
5535'	40.43°	348.81°	5478.63'	-60.81'
5583'	44.57°	352.80°	5514.02'	-28.79'
5630'	48.30°	355.67°	5546.40'	5.10'
5678'	52.35°	359.03°	5577.04'	42.00'



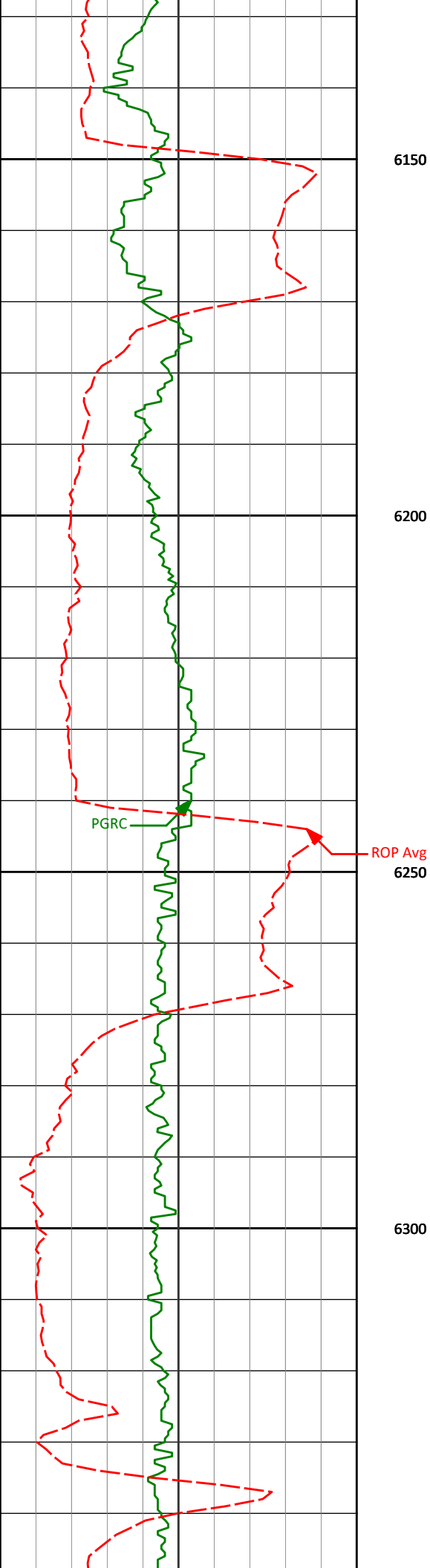
5725'	57.18°	2.13°	5604.15'	80.37'
5773'	62.58°	2.60°	5628.23'	121.83'
5820'	67.19°	3.51°	5648.17'	164.30'
5868'	70.09°	3.30°	5665.65'	208.91'



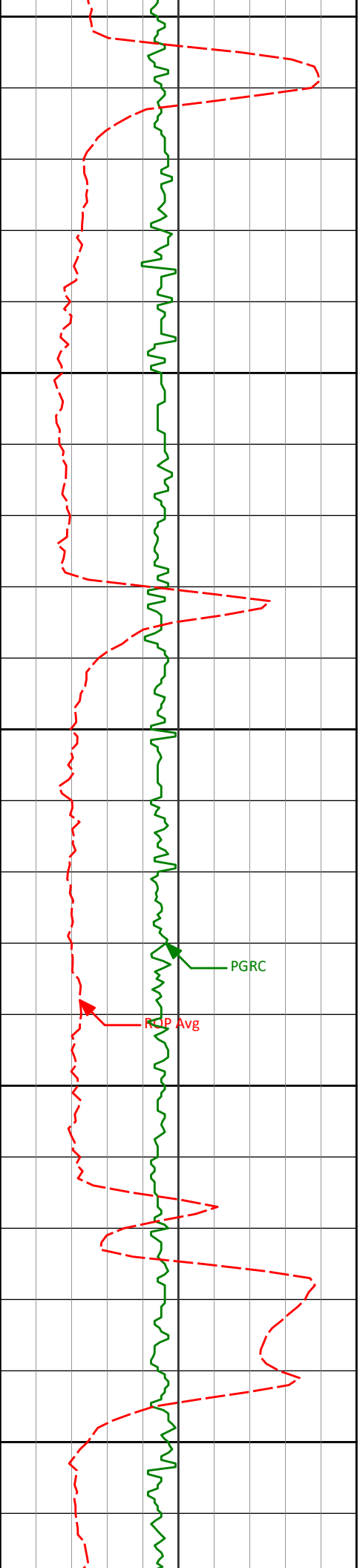
5915'	72.68°	1.22°	5680.66'	253.40'
5963'	76.04°	0.52°	5693.60'	299.61'
5991'	79.17°	359.59°	5699.61'	326.96'

<7" casing set at 6040' MD>

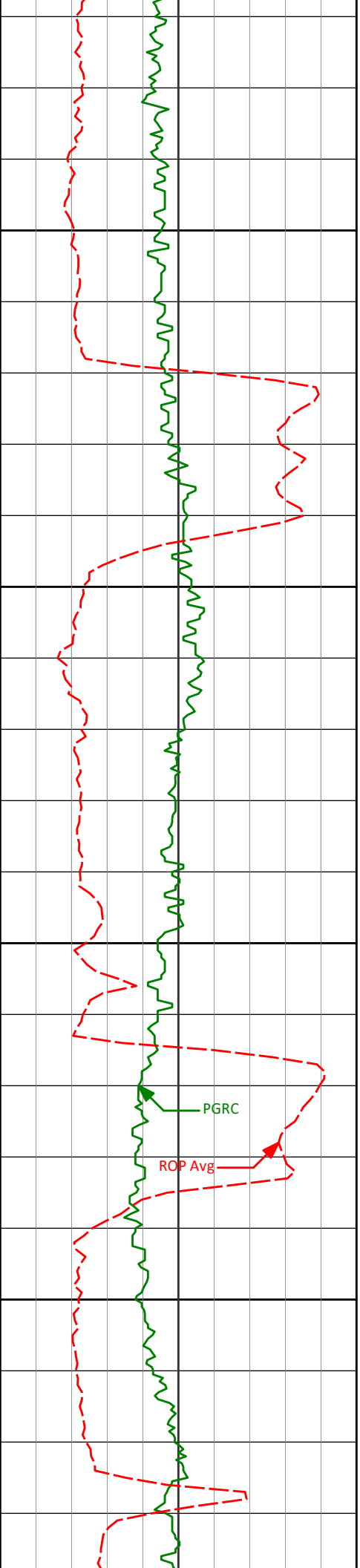
6090'	83.60°	359.67°	5714.43'	424.81'



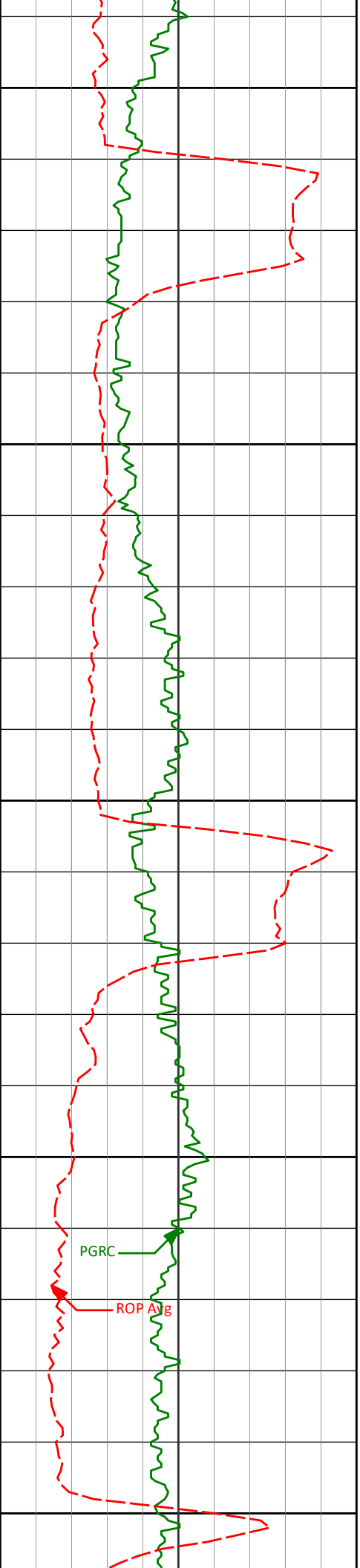
6183'	85.90°	0.59°	5722.94'	517.41'
6276'	89.04°	1.26°	5727.04'	610.29'



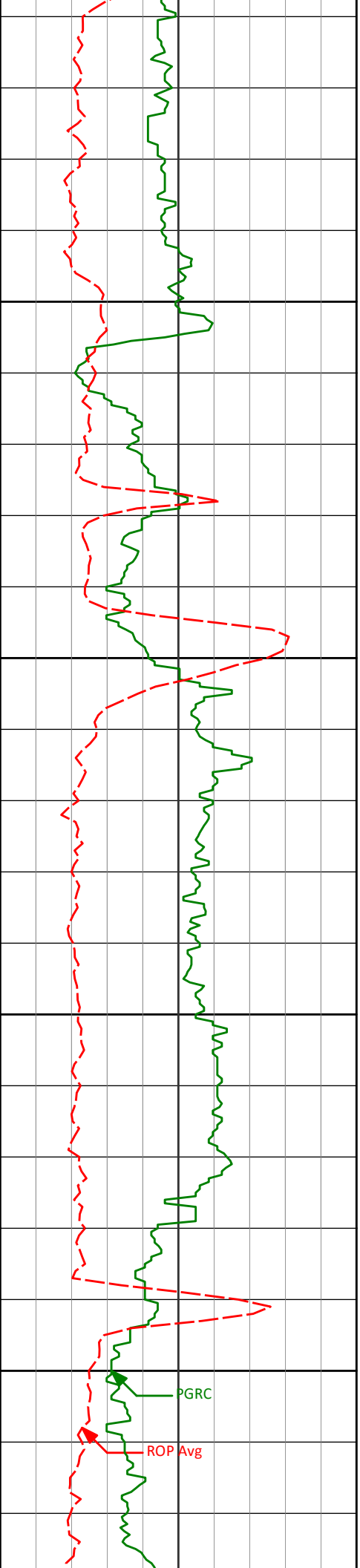
6371'	90.00°	0.67°	5727.83'	705.27'
6466'	90.31°	359.62°	5727.58'	800.26'
6561'	90.89°	359.76°	5726.58'	895.26'



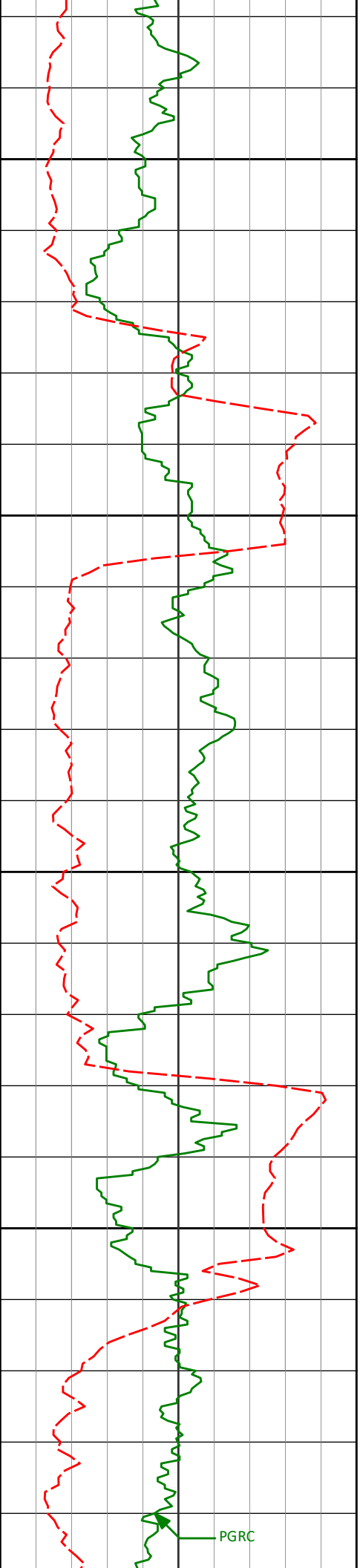
6656'	92.62°	1.86°	5723.67'	990.19'
6751'	92.06°	2.30°	5719.79'	1085.03'



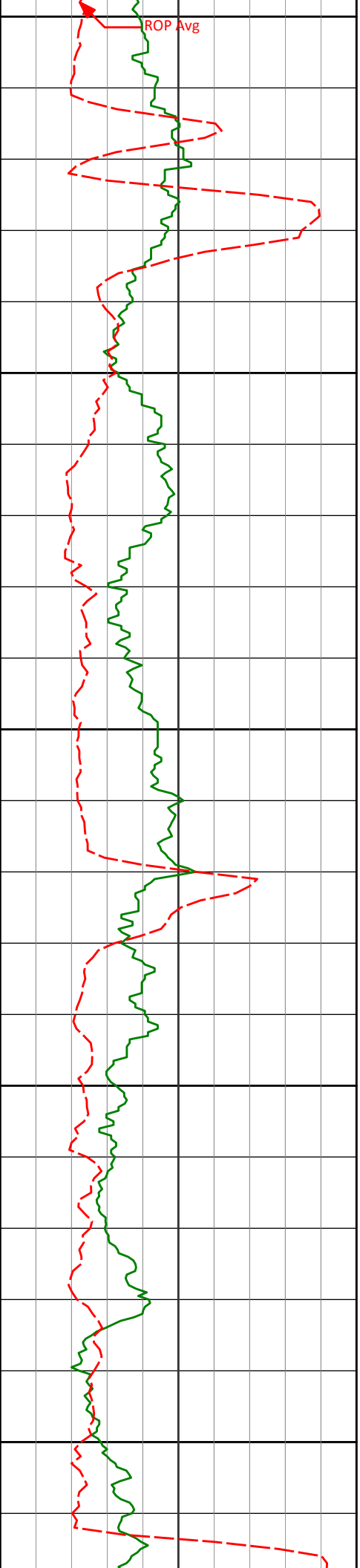
6845'	90.99°	1.06°	5717.28'	1178.95'
6940'	89.54°	1.11°	5716.85'	1273.92'



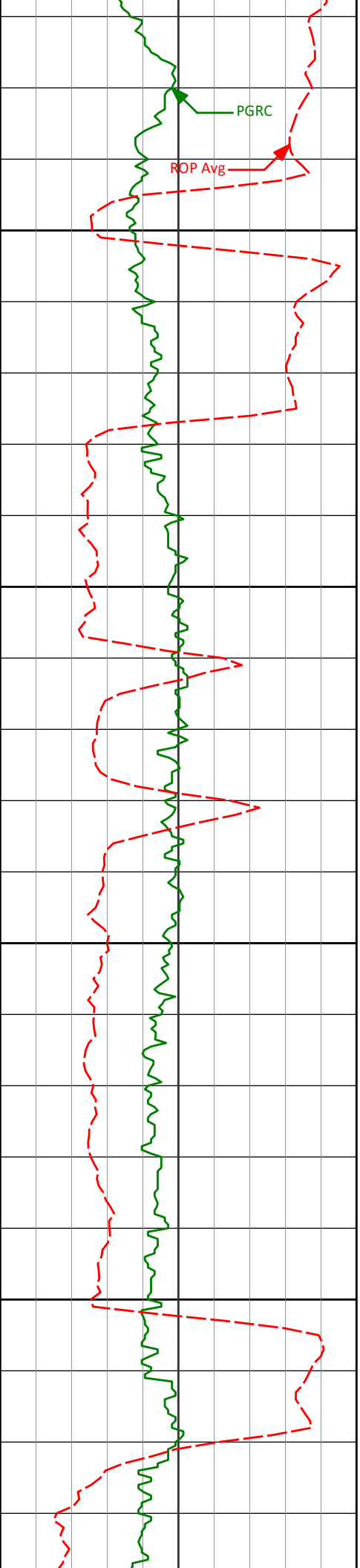
7035'	89.60°	0.84°	5717.57'	1368.89'
7130'	89.85°	1.07°	5718.03'	1463.87'
7225'	91.45°	0.66°	5716.95'	1558.85'



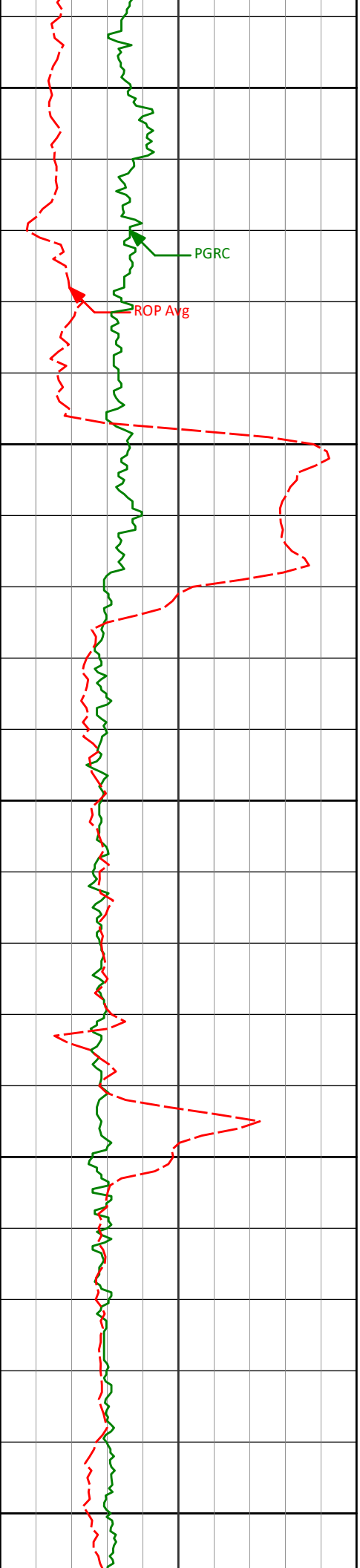
7320'	91.42°	359.04°	5714.58'	1653.81'
7415'	91.11°	359.07°	5712.48'	1748.78'



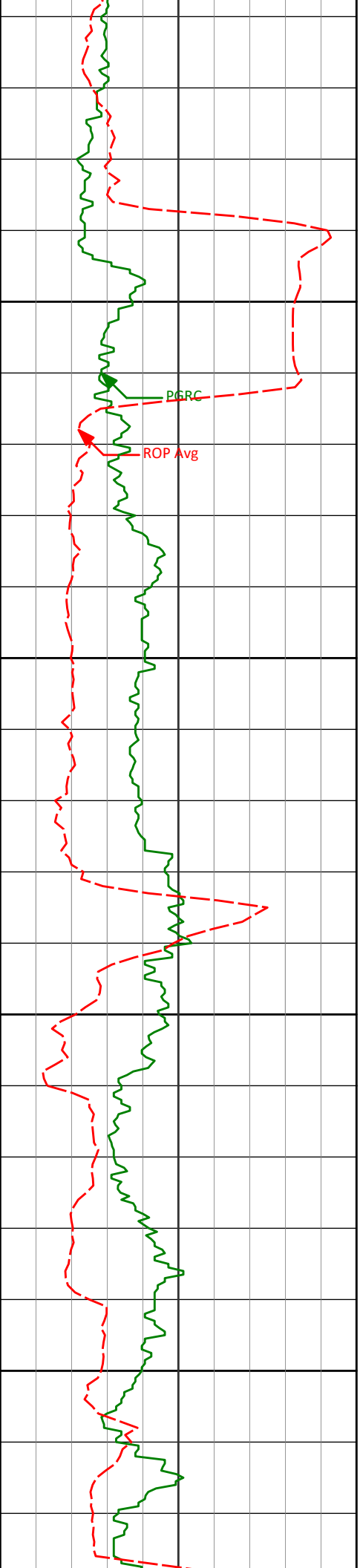
7510'	91.39°	358.44°	5710.41'	1843.74'
7605'	93.30°	358.24°	5706.52'	1938.63'



7699'	90.96°	358.86°	5703.04'	2032.54'
7794'	89.88°	358.44°	5702.34'	2127.51'



7889'	89.26°	357.60°	5703.06'	2222.46'
7984'	88.86°	358.61°	5704.62'	2317.41'
8079'	91.02°	359.22°	5704.72'	2412.39'



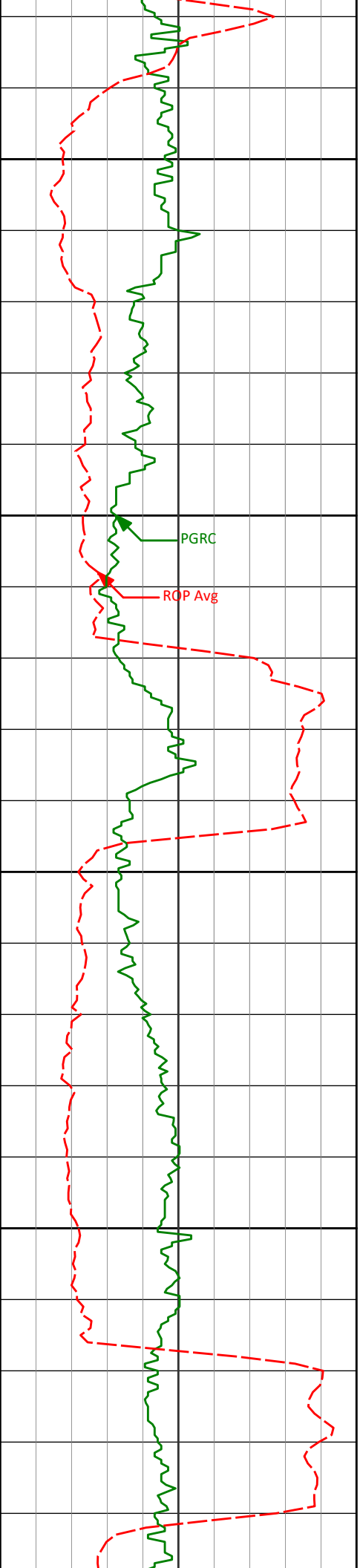
8150

8200

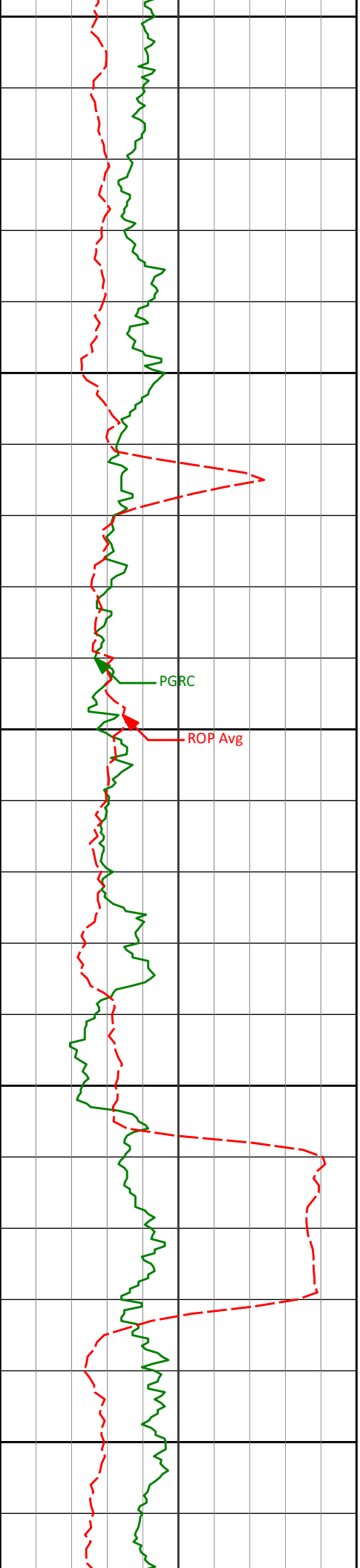
8250

8300

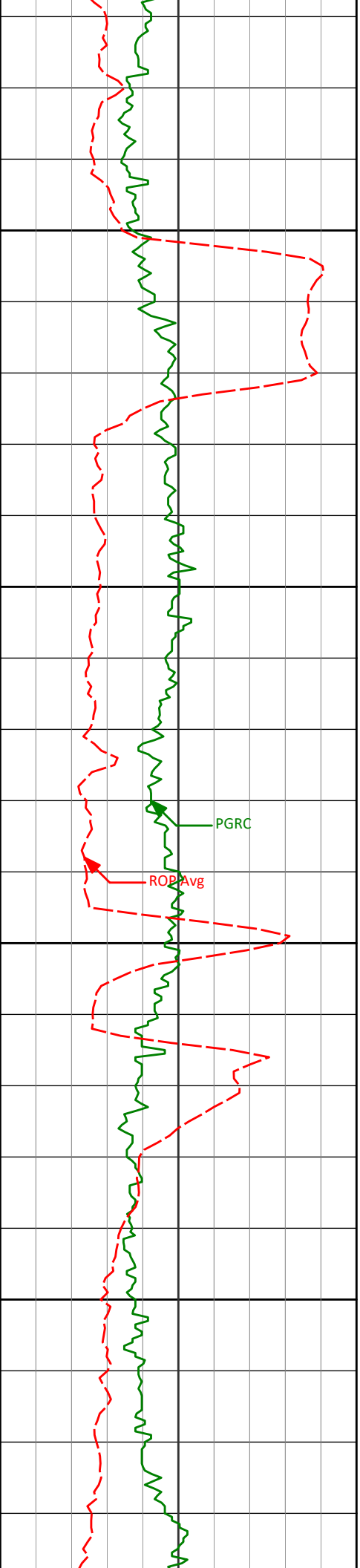
8174'	89.20°	358.08°	5704.54'	2507.37'
8269'	89.54°	357.00°	5705.59'	2602.29'



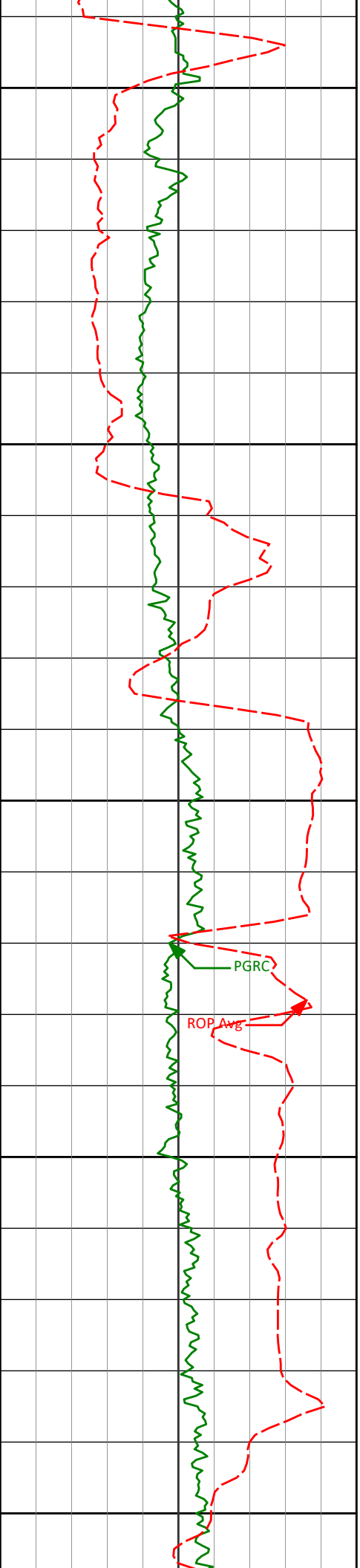
8363'	91.20°	357.00°	5704.98'	2696.17'
8458'	90.77°	358.51°	5703.34'	2791.10'



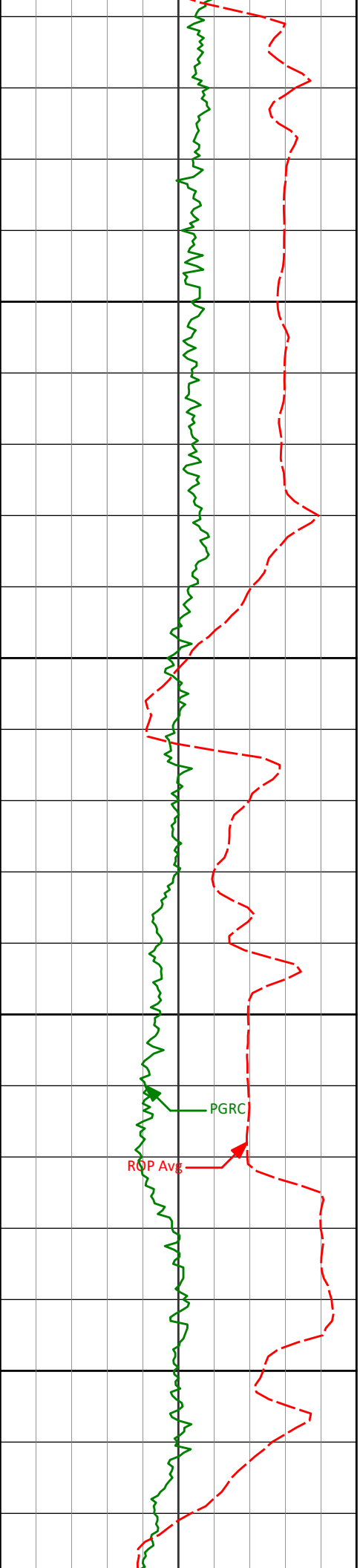
8553'	89.81°	358.35°	5702.86'	2886.07'
8648'	91.63°	359.08°	5701.65'	2981.04'
8743'	90.74°	359.26°	5699.69'	3076.01'



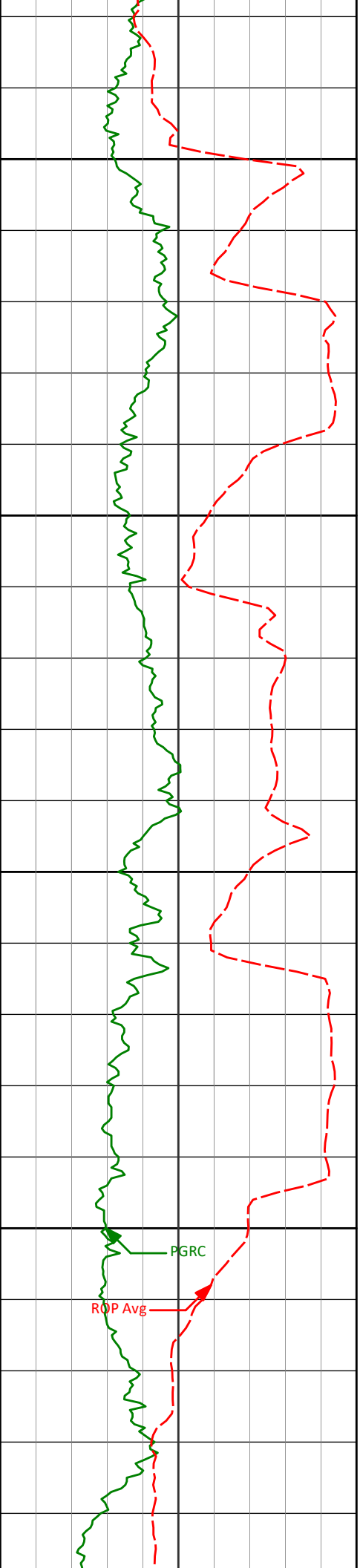
8838'	89.23°	358.63°	5699.71'	3171.00'
8933'	89.32°	359.24°	5700.91'	3265.98'



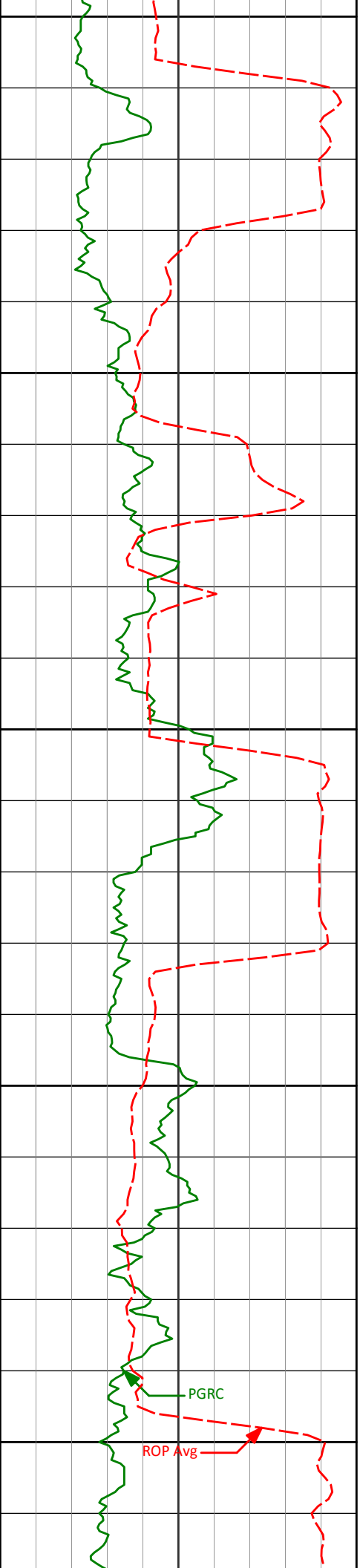
9028'	88.74°	358.07°	5702.52'	3360.95'
9122'	89.78°	359.91°	5703.74'	3454.92'



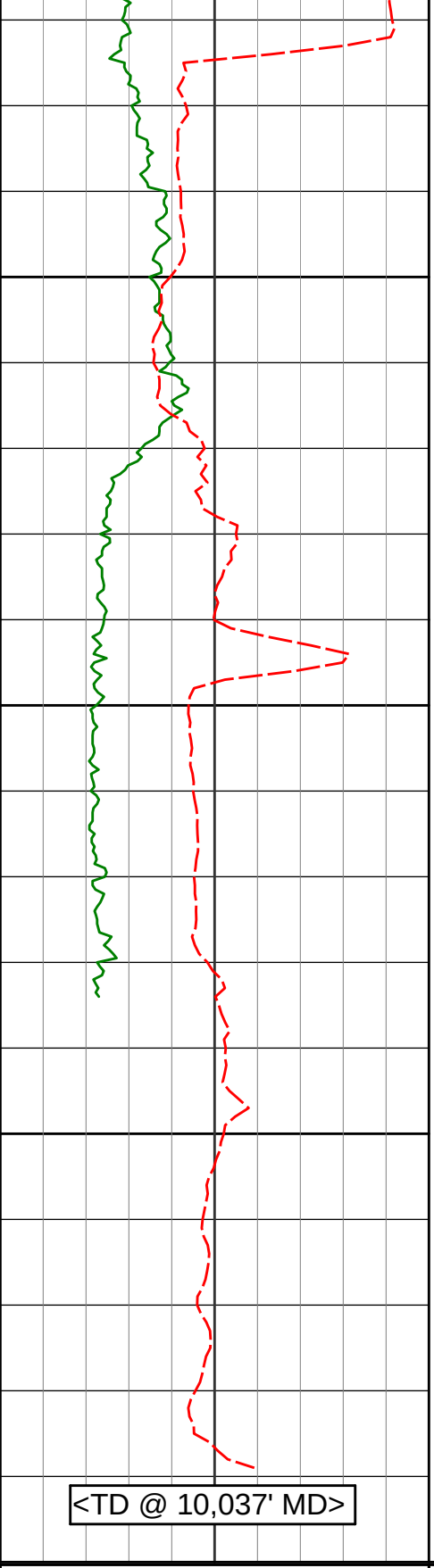
9218'	90.52°	358.19°	5703.48'	3550.91'
9313'	91.76°	356.97°	5701.59'	3645.82'
9407'	91.51°	359.14°	5698.90'	3739.73'



9502'	92.04°	0.39°	5695.96'	3834.68'
9597'	90.93°	1.36°	5693.51'	3929.63'



9692'	91.23°	2.23°	5691.72'	4024.56'
9787'	90.43°	1.12°	5690.34'	4119.49'



Depth ft	Depth	Inc.	Azi.	TVD	V.S.
9900					
9950					
10000					
	9882'	89.72°	0.12°	5690.21'	4214.48'
	9975'	91.05°	0.40°	5689.58'	4307.47'
	10037'	91.05°	0.40°	5688.45'	4369.46'

Avg Rate of Penetration
ROP Avg
500 feet per hr 0

PCG Gamma Ray
PGRC
0 api 300

HALLIBURTON

INSITE

DIRECTIONAL SURVEY REPORT

Noble Energy
Fiscus Federal LD23-78HN
Wildcat
Weld Colorado
USA
CA-XX-0900735955

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
244.00	0.80	202.93	243.99	1.57 S	0.66 W	-1.57	0.33
556.00	0.30	253.63	555.98	3.81 S	2.30 W	-3.80	0.21
718.00	0.38	212.12	717.98	4.38 S	2.99 W	-4.37	0.16
811.00	0.36	348.64	810.97	4.36 S	3.21 W	-4.34	0.74
903.00	0.53	246.33	902.97	4.24 S	3.65 W	-4.23	0.76
994.00	0.31	165.53	993.97	4.65 S	3.98 W	-4.63	0.62
1087.00	0.48	119.62	1086.97	5.08 S	3.57 W	-5.07	0.37
1179.00	0.10	278.27	1178.97	5.26 S	3.32 W	-5.25	0.62
1273.00	0.74	240.09	1272.97	5.55 S	3.93 W	-5.54	0.71
1366.00	0.28	356.19	1365.96	5.63 S	4.46 W	-5.61	0.97
1458.00	0.37	291.43	1457.96	5.29 S	4.76 W	-5.28	0.39
1553.00	0.49	42.39	1552.96	4.88 S	4.77 W	-4.87	0.75
1648.00	0.36	354.06	1647.96	4.29 S	4.53 W	-4.27	0.38
1743.00	0.77	119.62	1742.95	4.31 S	4.00 W	-4.29	1.08
1838.00	0.56	168.71	1837.95	5.08 S	3.35 W	-5.06	0.62
1933.00	0.26	158.24	1932.95	5.73 S	3.18 W	-5.72	0.32
2027.00	1.73	147.02	2026.93	7.12 S	2.33 W	-7.11	1.56
2122.00	3.49	170.01	2121.83	11.16 S	1.05 W	-11.16	2.12
2217.00	5.54	165.32	2216.53	18.44 S	0.61 E	-18.45	2.19
2312.00	6.39	159.42	2311.02	27.83 S	3.63 E	-27.84	1.11
2407.00	7.94	163.14	2405.27	39.06 S	7.39 E	-39.09	1.70
2501.00	9.60	162.61	2498.17	52.75 S	11.62 E	-52.80	1.77
2596.00	10.66	162.38	2591.69	68.68 S	16.64 E	-68.75	1.12
2691.00	10.78	161.74	2685.03	85.49 S	22.09 E	-85.57	0.18
2786.00	10.58	162.61	2778.39	102.24 S	27.47 E	-102.35	0.27
2881.00	9.90	156.32	2871.88	118.05 S	33.36 E	-118.17	1.37
2976.00	8.58	163.22	2965.65	132.31 S	38.69 E	-132.46	1.82
3071.00	7.90	164.13	3059.66	145.37 S	42.52 E	-145.53	0.73
3166.00	8.06	164.33	3153.75	158.05 S	46.10 E	-158.23	0.17
3260.00	8.34	163.25	3246.78	170.92 S	49.84 E	-171.11	0.34
3355.00	6.89	162.46	3340.94	182.96 S	53.55 E	-183.16	1.53
3450.00	5.63	161.69	3435.38	192.81 S	56.73 E	-193.03	1.33
3545.00	3.67	159.93	3530.06	200.08 S	59.23 E	-200.31	2.07
3640.00	4.50	175.42	3624.82	206.65 S	60.57 E	-206.88	1.45
3735.00	6.60	173.65	3719.37	215.80 S	61.48 E	-216.03	2.22
3830.00	4.06	149.80	3813.96	224.13 S	63.77 E	-224.38	3.49
3925.00	1.34	155.37	3908.85	228.05 S	65.93 E	-228.30	2.88
4020.00	0.32	168.76	4003.84	229.32 S	66.44 E	-229.57	1.08
4305.00	1.20	80.33	4288.81	229.60 S	69.54 E	-229.87	0.43
4400.00	1.57	103.14	4383.79	229.73 S	71.78 E	-230.00	0.69
4495.00	2.06	109.18	4478.74	230.58 S	74.65 E	-230.87	0.56
4590.00	2.17	80.21	4573.68	230.84 S	78.04 E	-231.14	1.12
4685.00	1.49	324.19	4668.65	229.53 S	79.09 E	-229.84	3.29
4780.00	1.60	327.80	4763.62	227.41 S	77.67 E	-227.71	0.15
4875.00	1.53	341.12	4858.58	225.10 S	76.55 E	-225.39	0.39
4968.00	0.77	331.52	4951.56	223.37 S	75.85 E	-223.66	0.84
5040.00	0.62	328.54	5023.56	222.61 S	75.42 E	-222.90	0.22
5156.00	7.96	339.54	5139.15	214.54 S	72.28 E	-214.82	6.34
5204.00	15.39	344.43	5186.13	205.28 S	69.40 E	-205.54	15.60
5251.00	19.63	342.99	5230.94	191.72 S	65.42 E	-191.97	9.08
5299.00	21.80	341.63	5275.83	175.54 S	60.25 E	-175.77	4.62
5345.00	24.54	342.99	5318.12	158.30 S	54.76 E	-158.51	6.08
5393.00	27.59	346.16	5361.23	137.97 S	49.18 E	-138.15	6.98
5440.00	31.52	346.11	5402.11	115.46 S	43.62 E	-115.63	8.36
5488.00	36.60	347.15	5441.86	89.31 S	37.43 E	-89.45	10.65
5535.00	40.43	348.81	5478.63	60.69 S	31.35 E	-60.81	8.43
5583.00	44.57	352.80	5514.02	28.69 S	26.22 E	-28.79	10.29
5630.00	48.30	355.67	5546.40	5.19 N	22.82 E	5.10	9.09

5678.00	52.35	359.03	5577.04	42.08 N	21.15 E	42.00	10.01
5725.00	57.18	2.13	5604.15	80.45 N	21.57 E	80.37	11.60
5773.00	62.58	2.60	5628.23	121.92 N	23.28 E	121.83	11.28
5820.00	67.19	3.51	5648.17	164.40 N	25.56 E	164.30	9.95
5868.00	70.09	3.30	5665.65	209.02 N	28.21 E	208.91	6.06
5915.00	72.68	1.22	5680.66	253.52 N	29.96 E	253.40	6.91
5963.00	76.04	0.52	5693.60	299.73 N	30.66 E	299.61	7.15
5991.00	79.17	359.59	5699.61	327.08 N	30.68 E	326.96	11.63
6090.00	83.60	359.67	5714.43	424.93 N	30.05 E	424.81	4.48
6183.00	85.90	0.59	5722.94	517.54 N	30.26 E	517.41	2.66
6276.00	89.04	1.26	5727.04	610.42 N	31.76 E	610.29	3.46
6371.00	90.00	0.67	5727.83	705.40 N	33.36 E	705.27	1.18
6466.00	90.31	359.62	5727.58	800.40 N	33.60 E	800.26	1.16
6561.00	90.89	359.76	5726.58	895.39 N	33.09 E	895.26	0.63
6656.00	92.62	1.86	5723.67	990.33 N	34.43 E	990.19	2.87
6751.00	92.06	2.30	5719.79	1085.19 N	37.88 E	1085.03	0.74
6845.00	90.99	1.06	5717.28	1179.11 N	40.64 E	1178.95	1.74
6940.00	89.54	1.11	5716.85	1274.09 N	42.44 E	1273.92	1.53
7035.00	89.60	0.84	5717.57	1369.07 N	44.05 E	1368.89	0.29
7130.00	89.85	1.07	5718.03	1464.06 N	45.64 E	1463.87	0.36
7225.00	91.45	0.66	5716.95	1559.04 N	47.08 E	1558.85	1.74
7320.00	91.42	359.04	5714.58	1654.00 N	46.83 E	1653.81	1.71
7415.00	91.11	359.07	5712.48	1748.97 N	45.26 E	1748.78	0.33
7510.00	91.39	358.44	5710.41	1843.92 N	43.19 E	1843.74	0.72
7605.00	93.30	358.24	5706.52	1938.80 N	40.43 E	1938.63	2.02
7699.00	90.96	358.86	5703.04	2032.70 N	38.06 E	2032.54	2.58
7794.00	89.88	358.44	5702.34	2127.67 N	35.82 E	2127.51	1.22
7889.00	89.26	357.60	5703.06	2222.61 N	32.54 E	2222.46	1.09
7984.00	88.86	358.61	5704.62	2317.54 N	29.40 E	2317.41	1.14
8079.00	91.02	359.22	5704.72	2412.52 N	27.60 E	2412.39	2.36
8174.00	89.20	358.08	5704.54	2507.48 N	25.36 E	2507.37	2.26
8269.00	89.54	357.00	5705.59	2602.39 N	21.28 E	2602.29	1.19
8363.00	91.20	357.00	5704.98	2696.26 N	16.36 E	2696.17	1.77
8458.00	90.77	358.51	5703.34	2791.17 N	12.64 E	2791.10	1.66
8553.00	89.81	358.35	5702.86	2886.13 N	10.04 E	2886.07	1.02
8648.00	91.63	359.08	5701.65	2981.09 N	7.91 E	2981.04	2.06
8743.00	90.74	359.26	5699.69	3076.06 N	6.53 E	3076.01	0.96
8838.00	89.23	358.63	5699.71	3171.04 N	4.78 E	3171.00	1.72
8933.00	89.32	359.24	5700.91	3266.02 N	3.01 E	3265.98	0.65
9028.00	88.74	358.07	5702.52	3360.97 N	0.78 E	3360.95	1.38
9122.00	89.78	359.91	5703.74	3454.95 N	0.88 W	3454.92	2.25
9218.00	90.52	358.19	5703.48	3550.93 N	2.47 W	3550.91	1.95
9313.00	91.76	356.97	5701.59	3645.82 N	6.49 W	3645.82	1.83
9407.00	91.51	359.14	5698.90	3739.72 N	9.68 W	3739.73	2.33
9502.00	92.04	0.39	5695.96	3834.67 N	10.07 W	3834.68	1.42
9597.00	90.93	1.36	5693.51	3929.63 N	8.62 W	3929.63	1.55
9692.00	91.23	2.23	5691.72	4024.56 N	5.65 W	4024.56	0.97
9787.00	90.43	1.12	5690.34	4119.51 N	2.87 W	4119.49	1.44
9882.00	89.72	0.12	5690.21	4214.50 N	1.84 W	4214.48	1.30
9975.00	91.05	0.40	5689.58	4307.50 N	1.42 W	4307.47	1.46
10037.00	91.05	0.40	5688.45	4369.49 N	0.99 W	4369.46	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 359.78 DEGREES (GRID)
A TOTAL CORRECTION OF 7.03 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10037.00 FEET
IS 4369.49 FEET ALONG 359.99 DEGREES (GRID)

Surface surveys at 244 ft and 556 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 9975 ft MD to TD at 10037 ft MD.

Date Printed:22 September 2013