GAMMA RAY

Scientific Drilling

5" = 100' FEET MD

COMPANY : ANADARKO E&P ONSHORE LLC
WELL : BANE 28N1-9HZ
FIELD : WATTENBERG
COUNTY : WELD
STATE : COLORADO
COUNTRY : U.S.A.
UWI : 05-123-41305

COMPANY : ANADARKO E&P ONSHORE LLC
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COUNTY : WELD
STATE : COLORADO
COUNTRY : U.S.A.
UWI : 05-123-41305

WELL LOCATION
LAT:40°3'37.595"N LONG:104°39'55.750"W
N:14548919.18 ft E:1734015.07 ft

SEC:09 TWP:1N RANGE:65W

OTHER SERVICES

DIRECTIONAL
ROP

DEPTH REF. : RKB
REF. HEIGHT : 25.000 ft RKB to Ground Level
GROUND LEVEL : 4964.000 ft G.L. to MEAN SEA LEVEL

BOREHOLE RECORD

HOLE SIZE in	FROM ft	TO ft
8.5	1616	11998

DEVIATION RECORD

INCLINATION deg	FROM ft	TO ft
0 - 20	0	6641
20-90	6641	7775
90-92	7775	11998

CASING RECORD

CASING SIZE in	FROM ft	TO ft
9.125	0	1606

DRILLING CO. : H&P
RIG : 307
LWD UNIT NO. : C-46 DISTRICT : CASPER
SPUD DATE : 07/20/2015
LWD START DATE : 07/20/2015 DEPTH : 1616 ft
LWD END DATE : 07/23/2015 DEPTH : 11998 ft
TOTAL DEPTH : 11998 ft

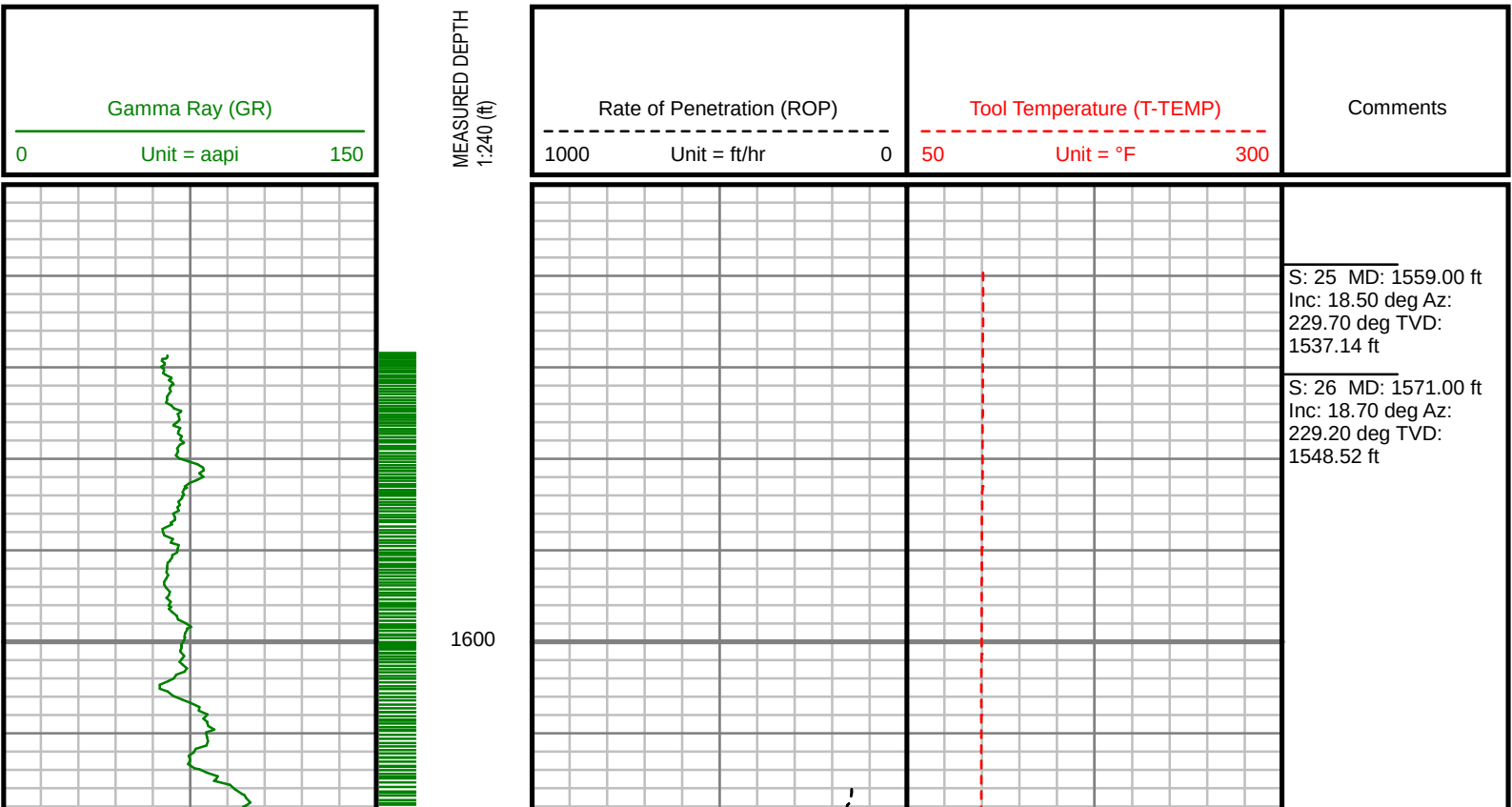
Run Data

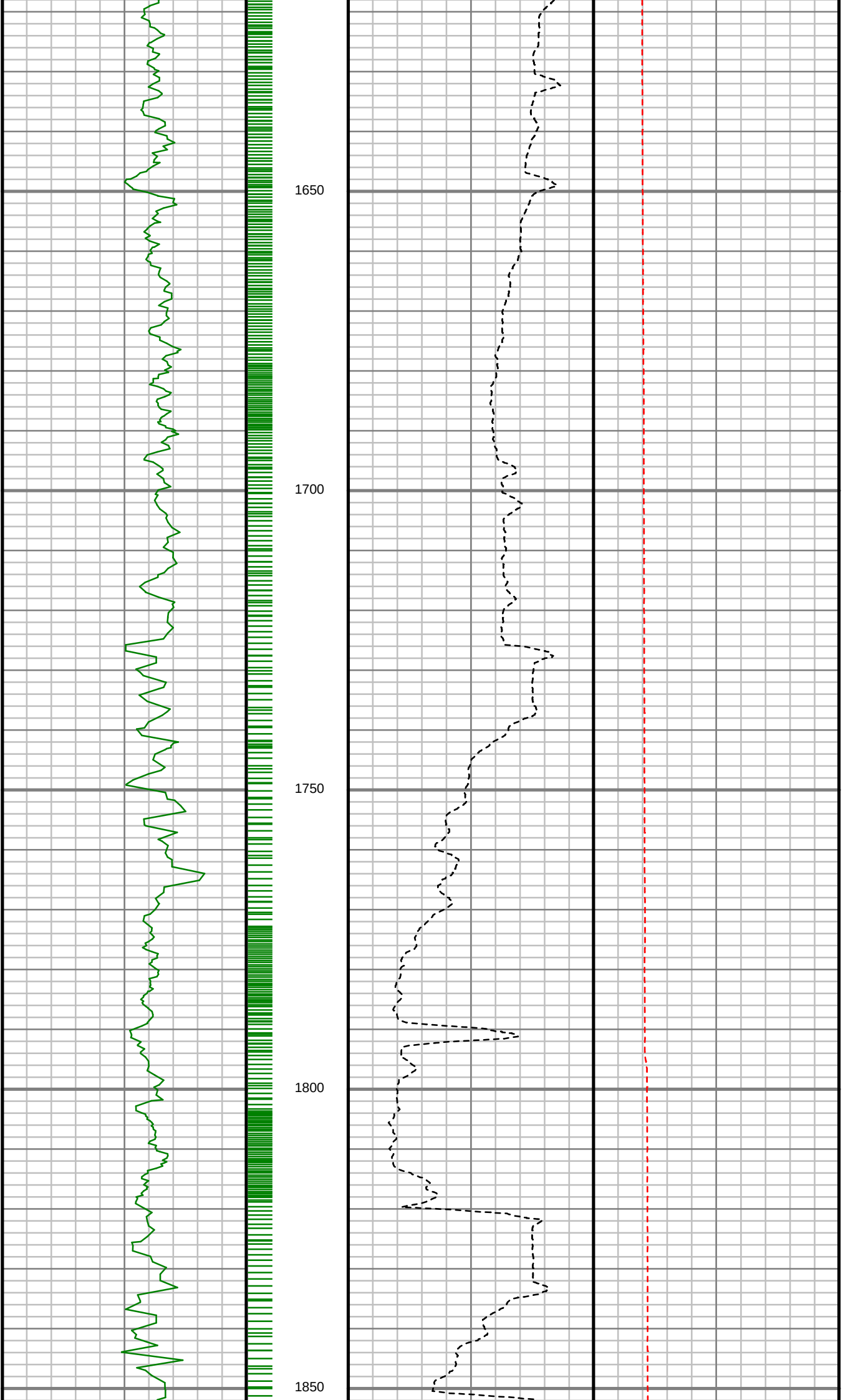
RUN NUMBER	1	2	3
START DATE	07/20/2015	07/20/2015	07/22/2015
START TIME	1525	2300	0000
END DATE	07/20/2015	07/22/2015	07/24/2015
END TIME	2300	0000	0130
DEPTH IN (ft)	1616	1851	6712
DEPTH OUT (ft)	1851	6712	11998
LOG TOP (ft)	1569	1804	6665
LOG BOTTOM (ft)	1804	6665	11998
HOLE SIZE (in)	8.5	8.5	8.5
MUD DATA @ (ft)	1616	6661	8814
MUD TYPE	OIL-BASED	OIL-BASED	OIL-BASED
DENSITY (lb / gal)	8.95	9.5	9.5
VISCOSITY (s / qt)	91	76	65
pH	-	-	-
FLUID LOSS (cm3 / 30)	3.2	3.2	3.2
SALINITY (ppm)	-	-	-
Rm (ohmm @ deg F)	-	-	-
Rmf (ohmm @ deg F)	-	-	-
MAX TEMP (deg F)	105	168	220
Rm @ MAX TEMP (ohmm)	-	-	-
LWD ENGINEER #1	M. SCHUSTER	M. SCHUSTER	S. WAXLER
LWD ENGINEER #2	S. WAXLER	S. WAXLER	B. GREER
LWD ENGINEER #3	-	-	-
LOG WITNESS #1	S. SADLE	S. SADLE	S. SADLE
LOG WITNESS #2	R. CANNON	R. CANNON	R. CANNON

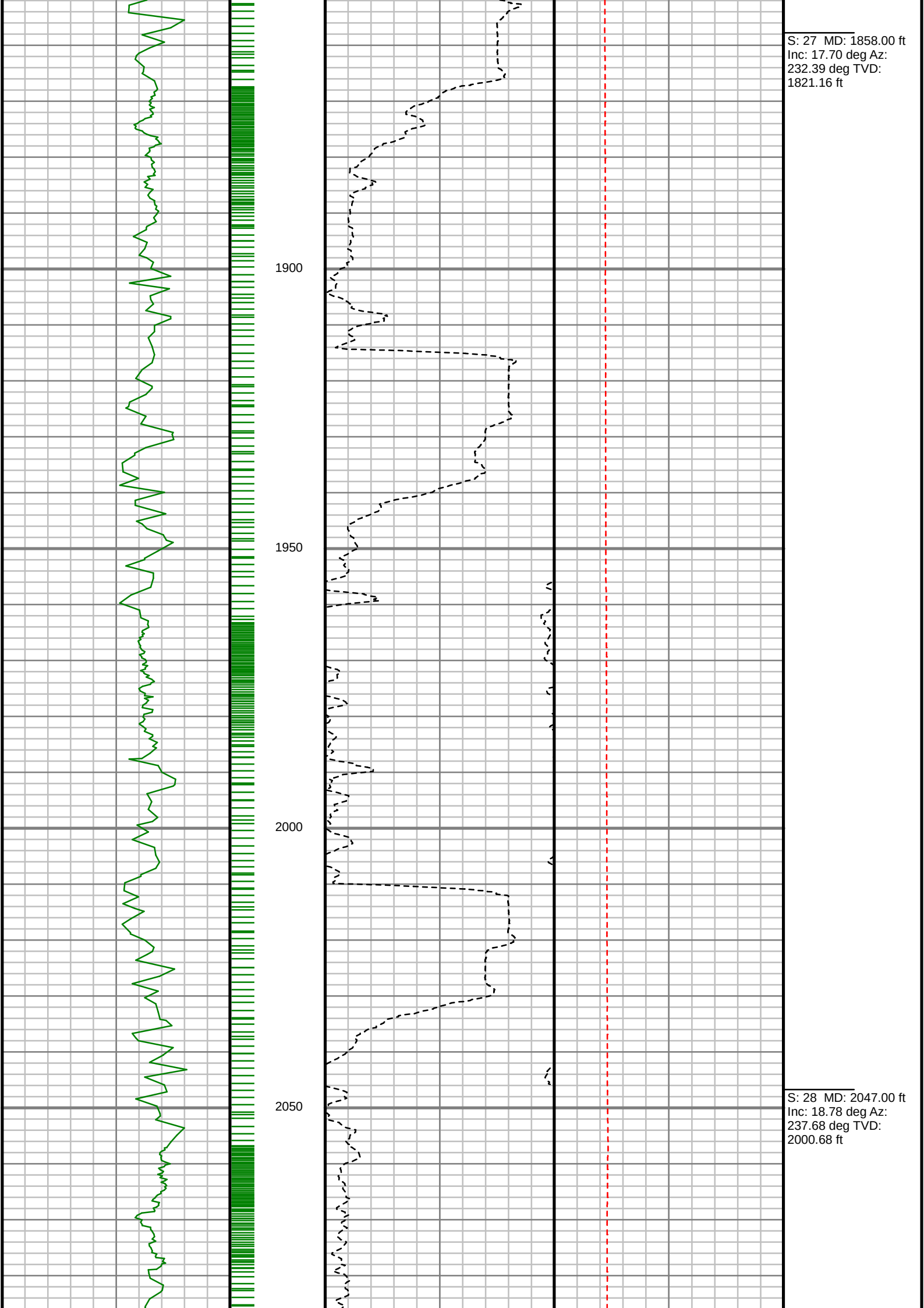
Remarks
ANADARKO E&P ONSHORE LLC PRODUCTION AFE# 2106134
SCIENTIFIC DRILLING INTERNATIONAL JOB# 298083
ALL REFERENCES IN THE DEPTH TRACK ARE AT BIT DEPTH.
ALL DATA IS MEMORY DATA UNLESS STATED OTHERWISE.
FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO GAMMA RAY CURVE
FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO RATE OF PENETRATION CURVE
FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO TOOL TEMPERATURE CURVE
RUN #1: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 128-165 / CONT = 225 / MWD EYE = 1015 / GAMMA RAY = 1209
BIT TO SENSOR OFFSETS: SURVEY = 56.45 FT. / GAMMA RAY = 47.39 FT.
RUN #2: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 128-338 / CONT = 862 / MWD EYE = 882 / GAMMA RAY = 1188
BIT TO SENSOR OFFSETS: SURVEY = 56.45 FT. / GAMMA RAY = 47.39 FT.
RUN #3: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 128-338 / CONT = 862 / MWD EYE = 882 / GAMMA RAY = 1188
BIT TO SENSOR OFFSETS: SURVEY = 55.96 FT. / GAMMA RAY = 47.31 FT.
MNEMONICS LIST:
GR = GAMMA RAY
ROP = RATE OF PENETRATION
T-TEMP = TOOL TEMPERATURE

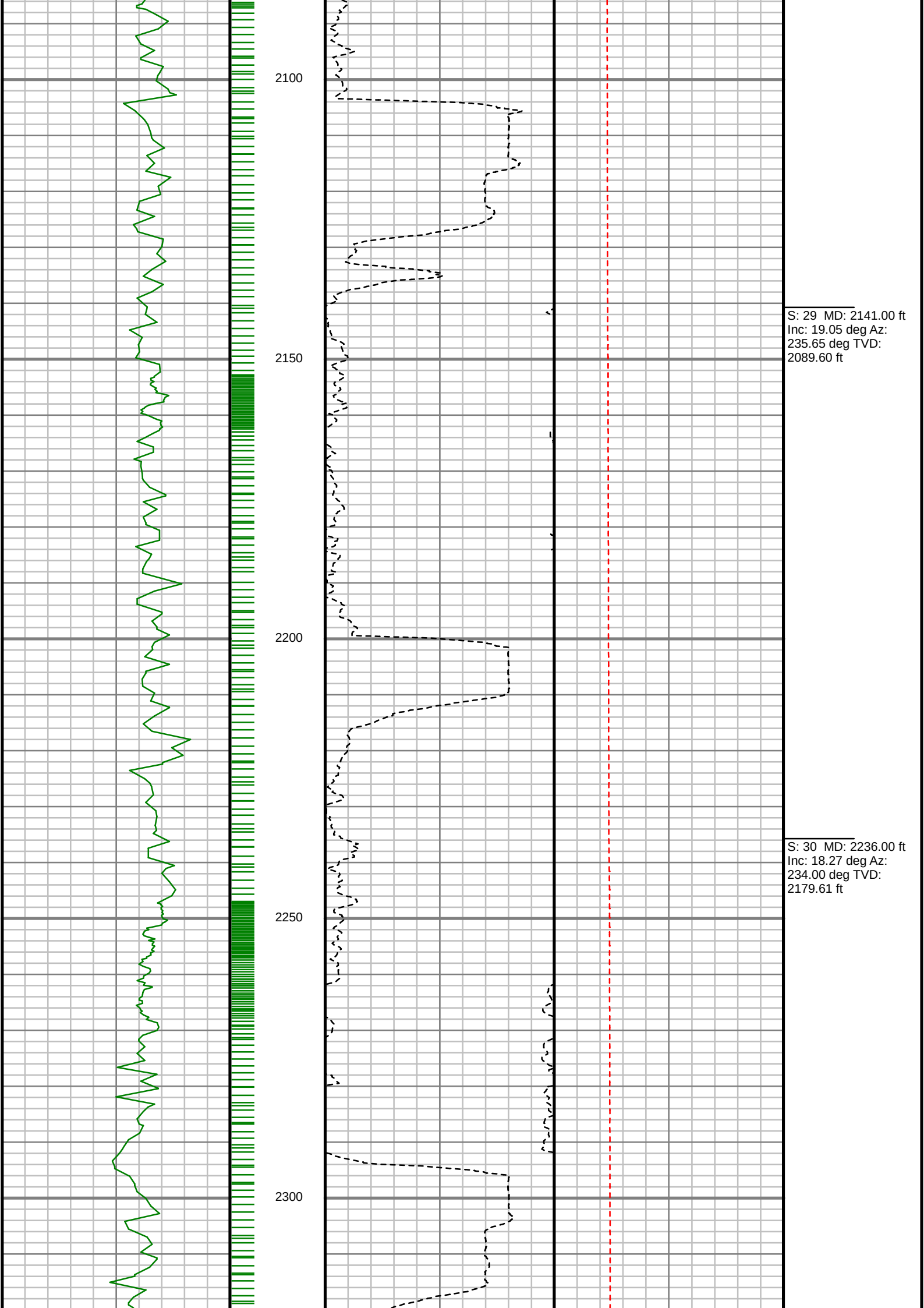
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. These interpretations are also subject to our general terms and conditions as set out in our current price schedule.

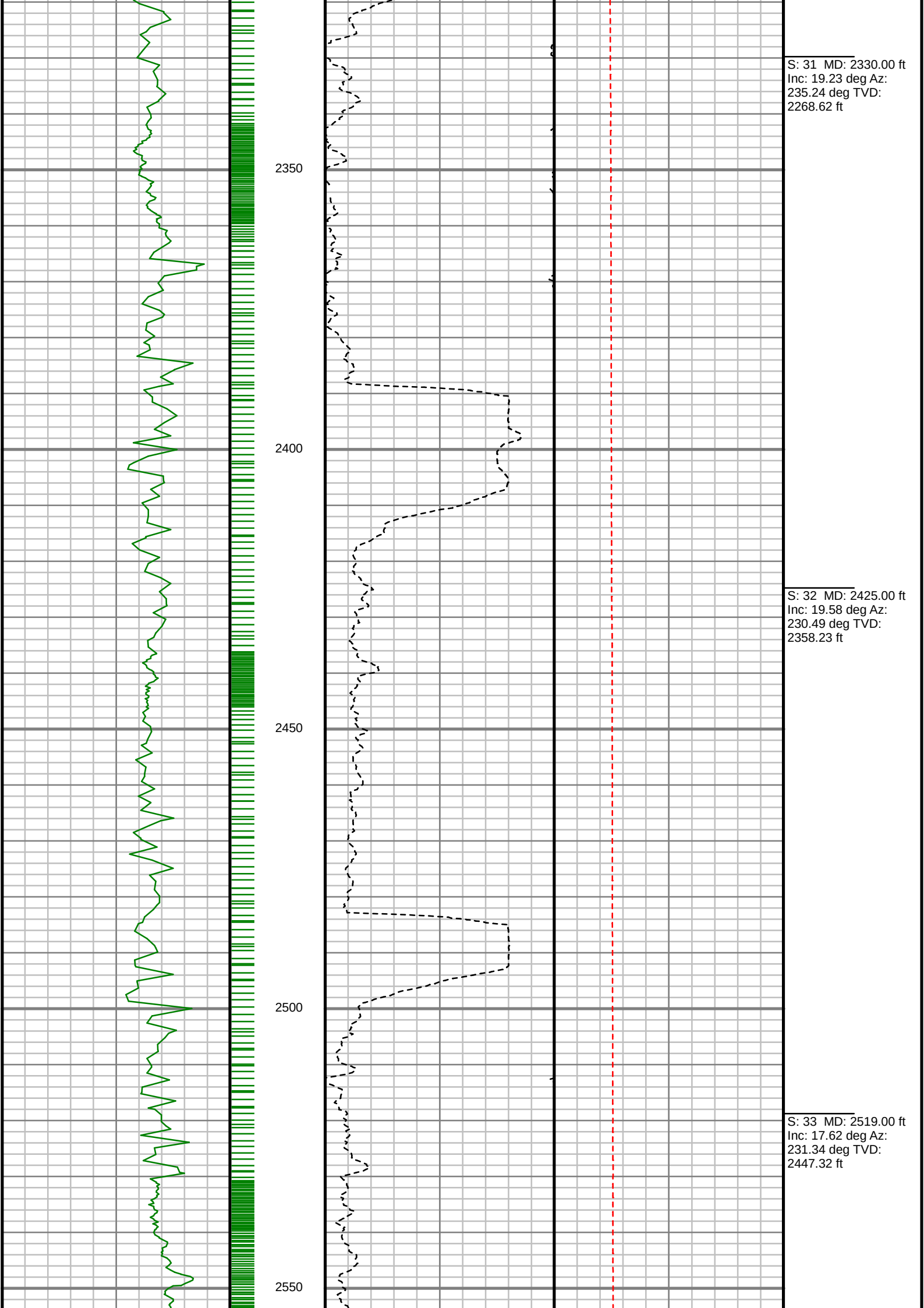
ANADARKO E&P ONSHORE LLC
BANE 28N1-9HZ
WATTENBERG FIELD
WELD COUNTY, COLORADO
05-123-41305

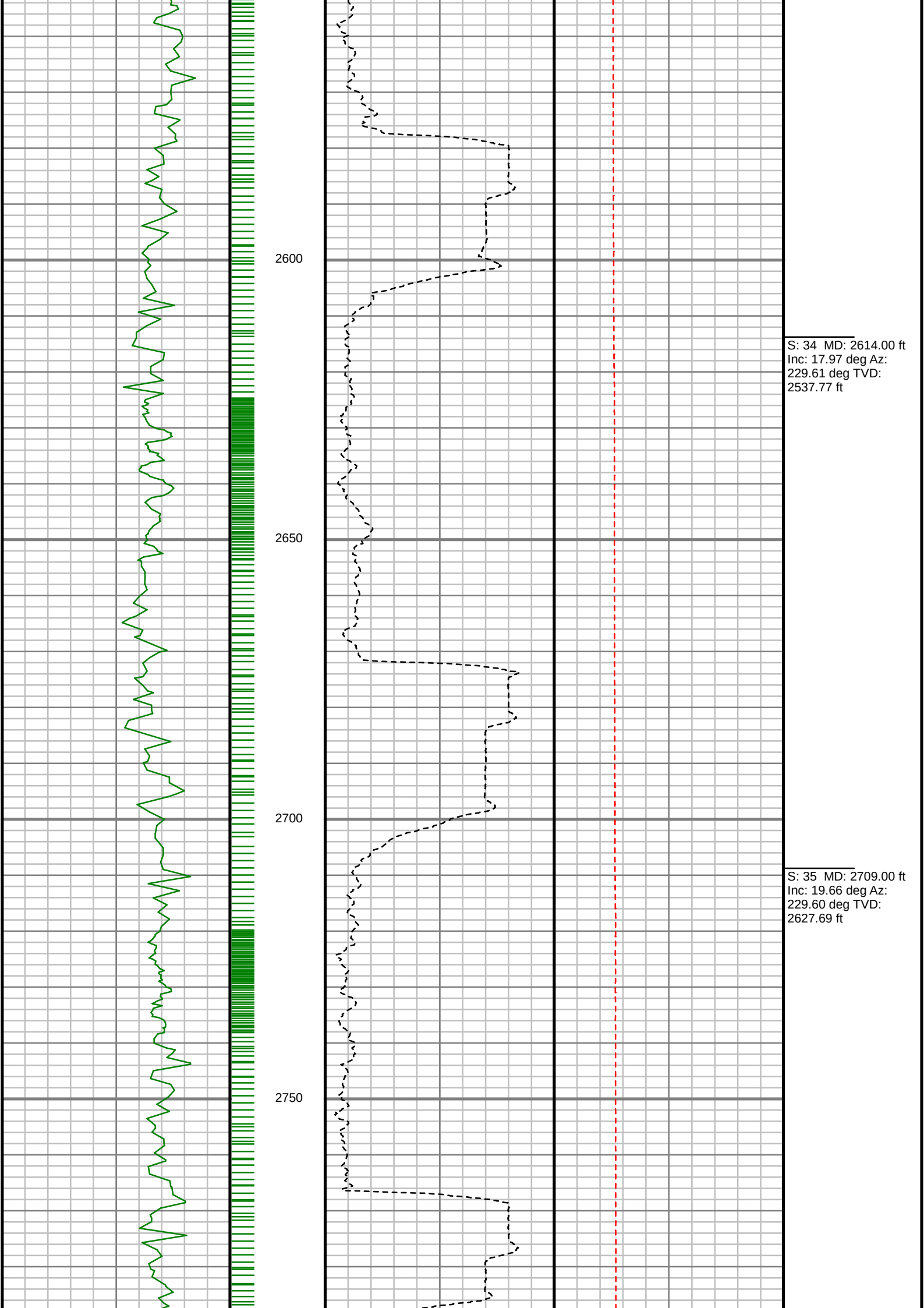


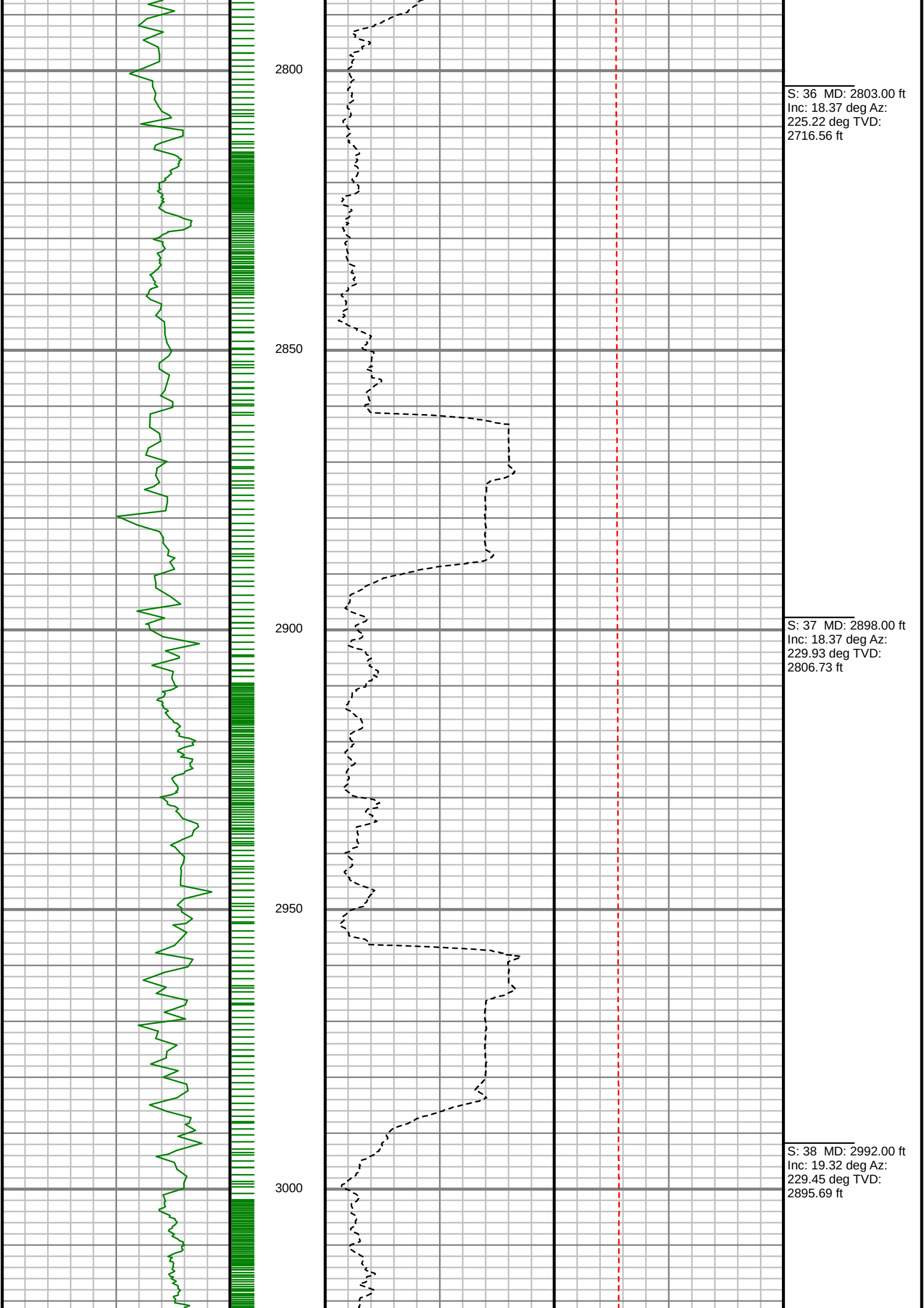

1650
1700
1750
1800
1850

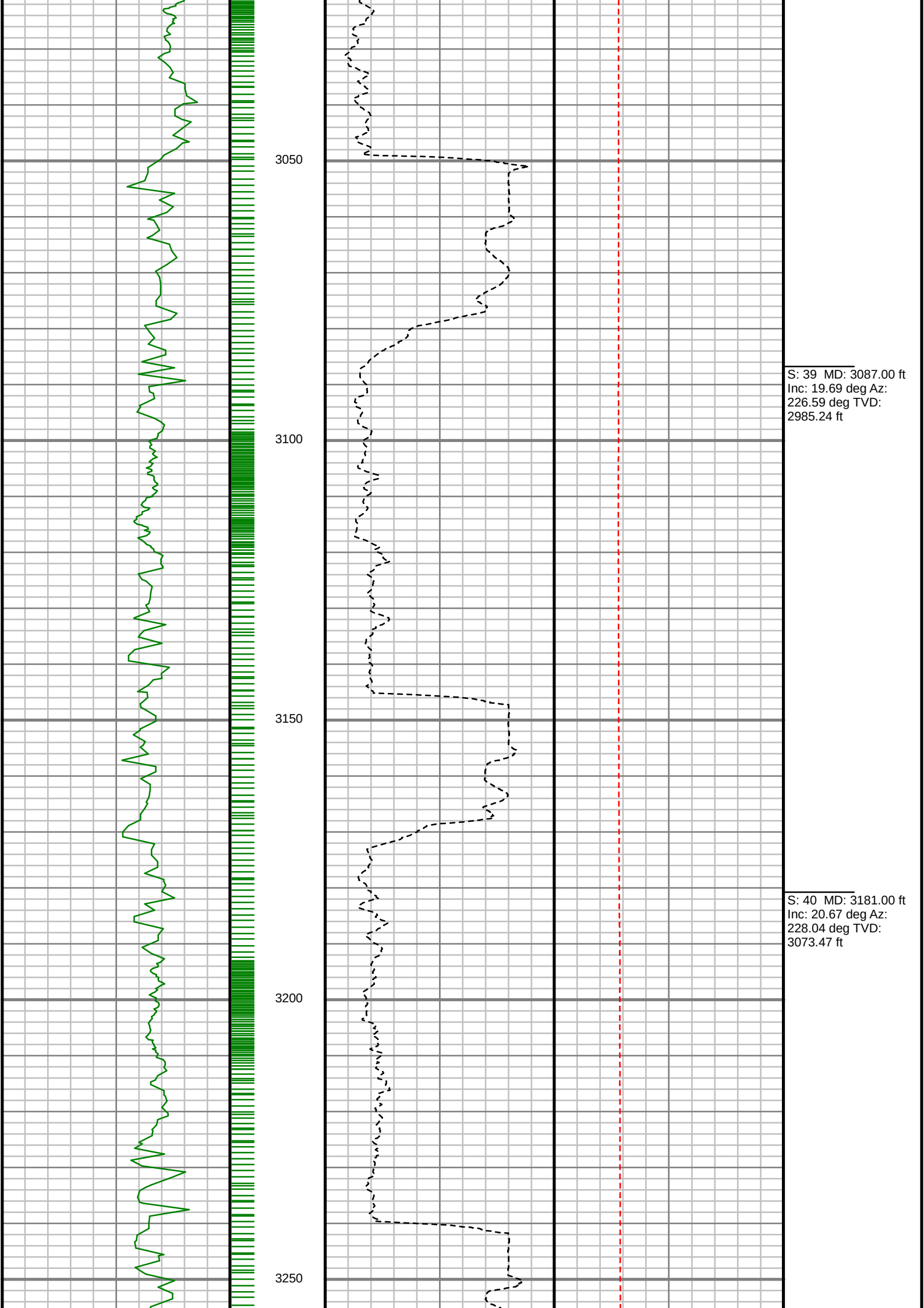

S: 27 MD: 1858.00 ft
Inc: 17.70 deg Az:
232.39 deg TVD:
1821.16 ft
1900
1950
2000
2050
S: 28 MD: 2047.00 ft
Inc: 18.78 deg Az:
237.68 deg TVD:
2000.68 ft

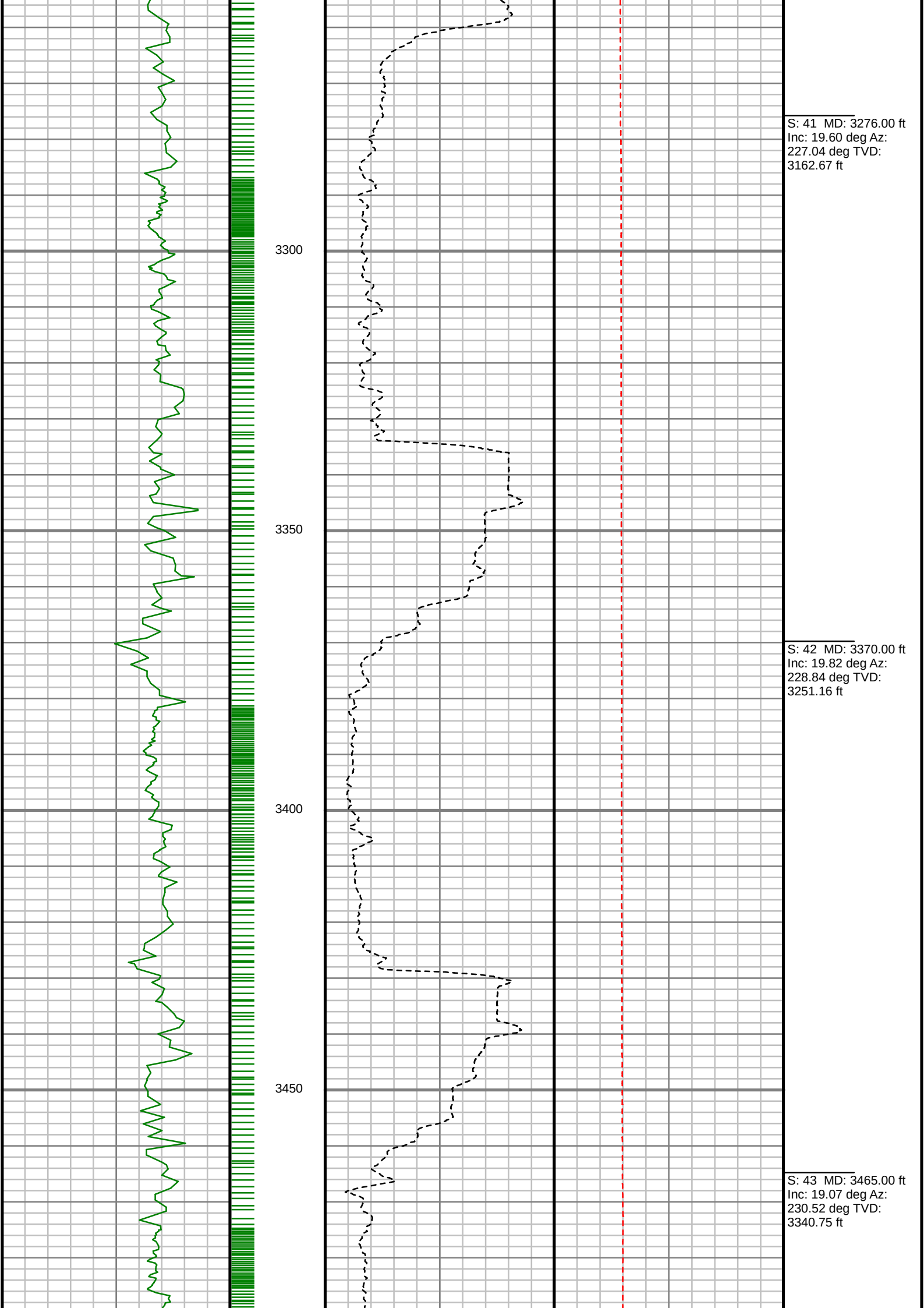

2100
2150
2200
2250
2300
S: 29 MD: 2141.00 ft
Inc: 19.05 deg Az:
235.65 deg TVD:
2089.60 ft
S: 30 MD: 2236.00 ft
Inc: 18.27 deg Az:
234.00 deg TVD:
2179.61 ft

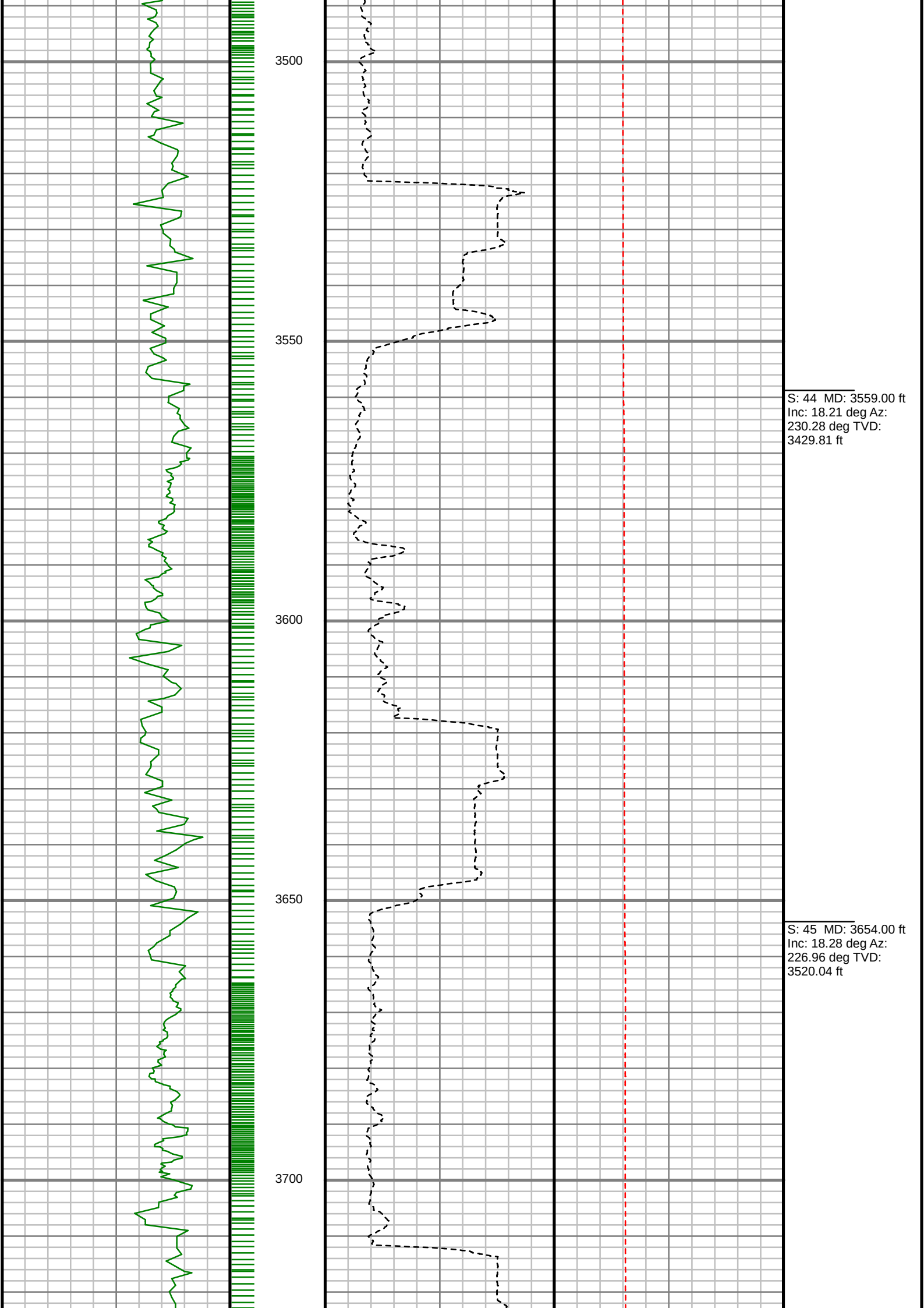

S: 31 MD: 2330.00 ft
Inc: 19.23 deg Az:
235.24 deg TVD:
2268.62 ft
2350
2400
S: 32 MD: 2425.00 ft
Inc: 19.58 deg Az:
230.49 deg TVD:
2358.23 ft
2450
2500
S: 33 MD: 2519.00 ft
Inc: 17.62 deg Az:
231.34 deg TVD:
2447.32 ft
2550

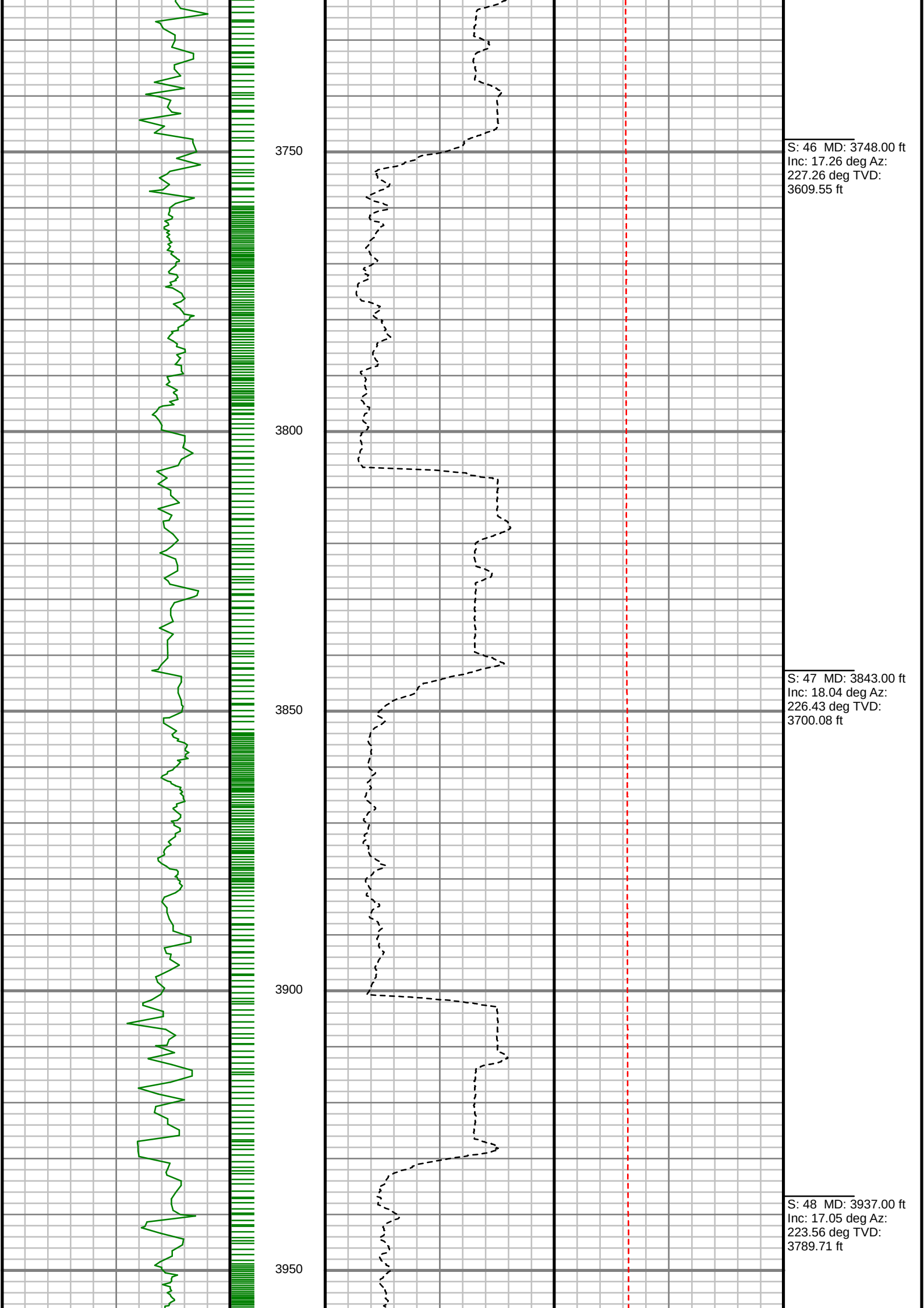

2600
2650
2700
2750
S: 34 MD: 2614.00 ft
Inc: 17.97 deg Az:
229.61 deg TVD:
2537.77 ft
S: 35 MD: 2709.00 ft
Inc: 19.66 deg Az:
229.60 deg TVD:
2627.69 ft

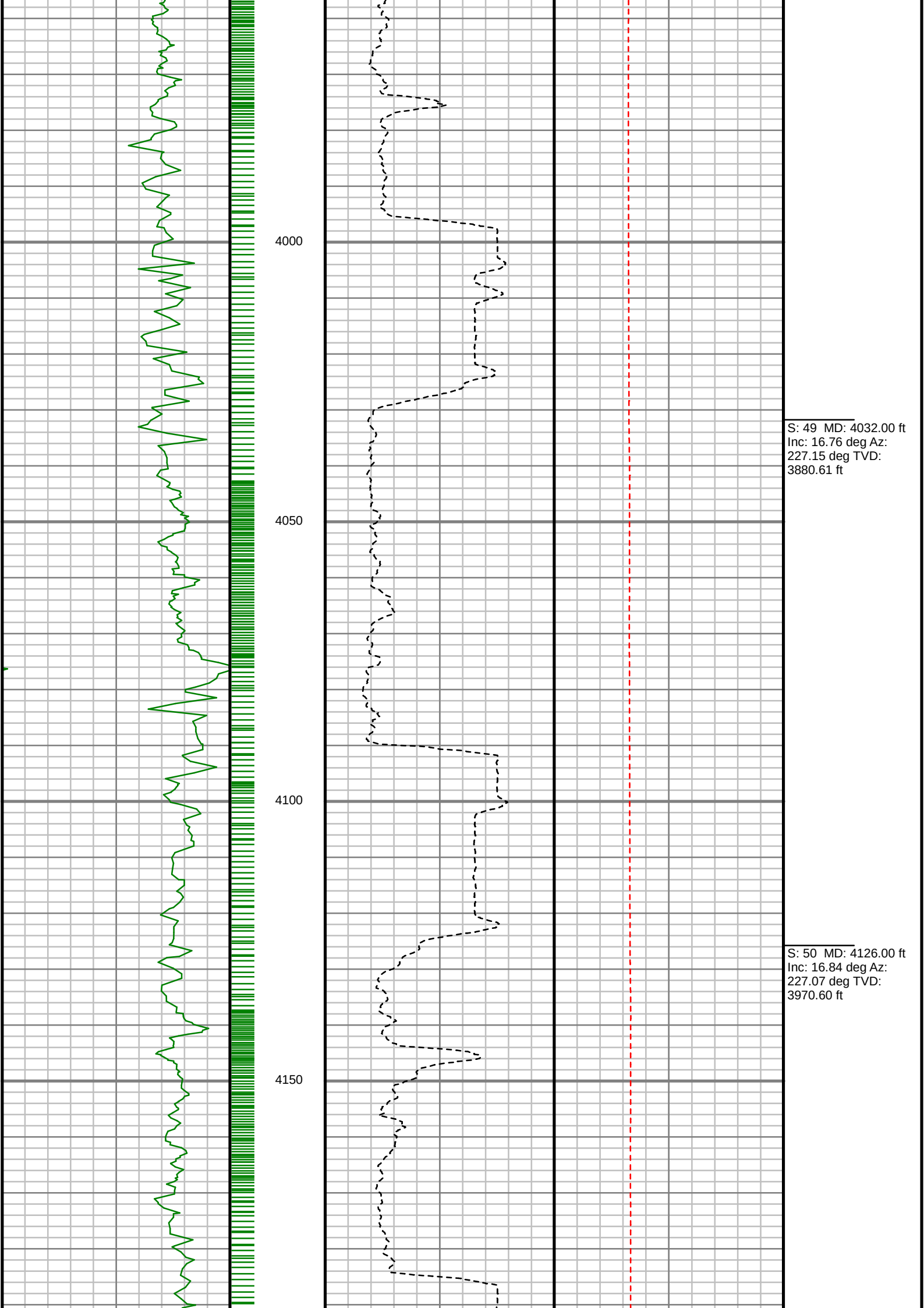

2800
2850
2900
2950
3000
S: 36 MD: 2803.00 ft
Inc: 18.37 deg Az:
225.22 deg TVD:
2716.56 ft
S: 37 MD: 2898.00 ft
Inc: 18.37 deg Az:
229.93 deg TVD:
2806.73 ft
S: 38 MD: 2992.00 ft
Inc: 19.32 deg Az:
229.45 deg TVD:
2895.69 ft

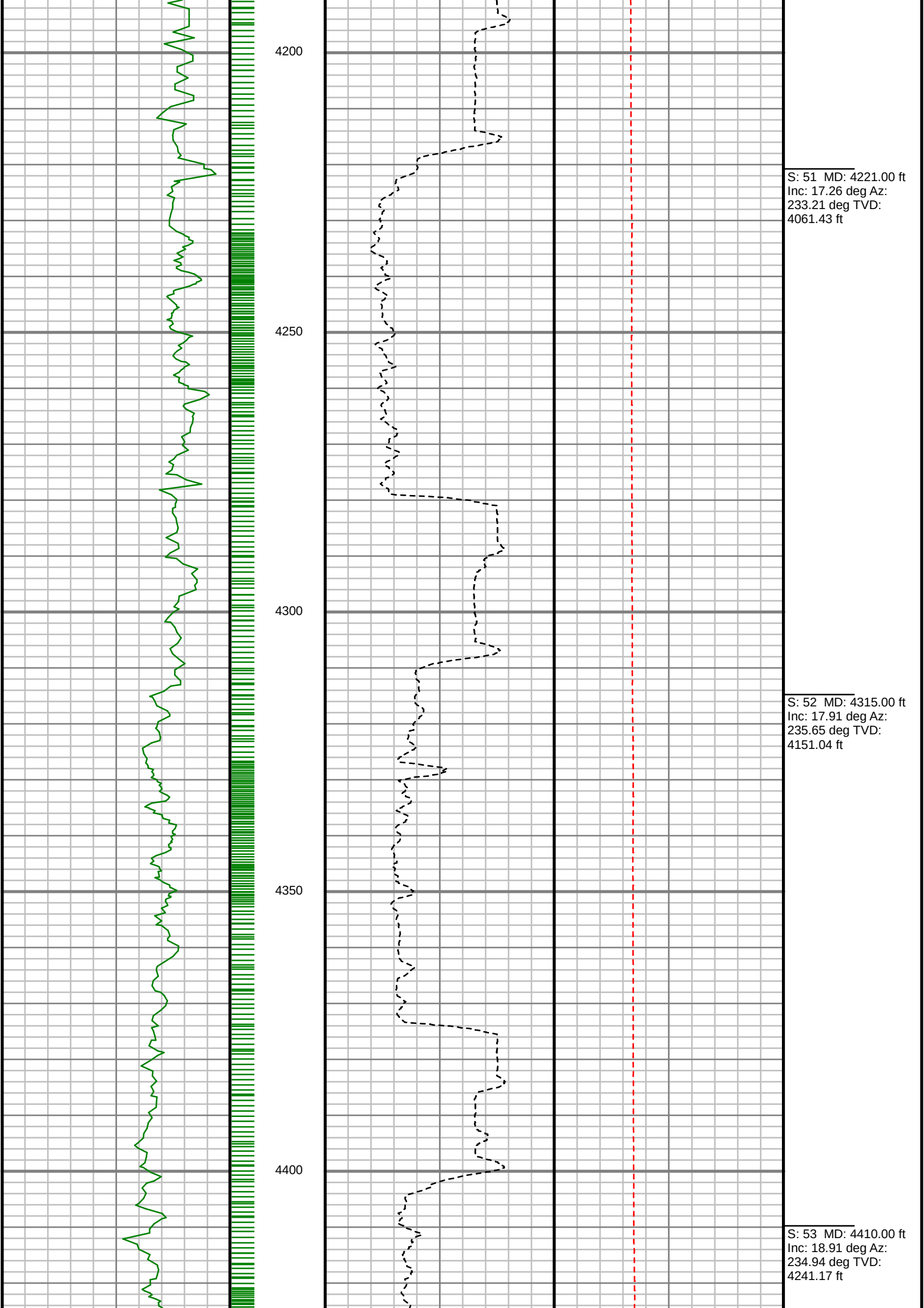

3050
3100
3150
3200
3250
S: 39 MD: 3087.00 ft
Inc: 19.69 deg Az:
226.59 deg TVD:
2985.24 ft
S: 40 MD: 3181.00 ft
Inc: 20.67 deg Az:
228.04 deg TVD:
3073.47 ft

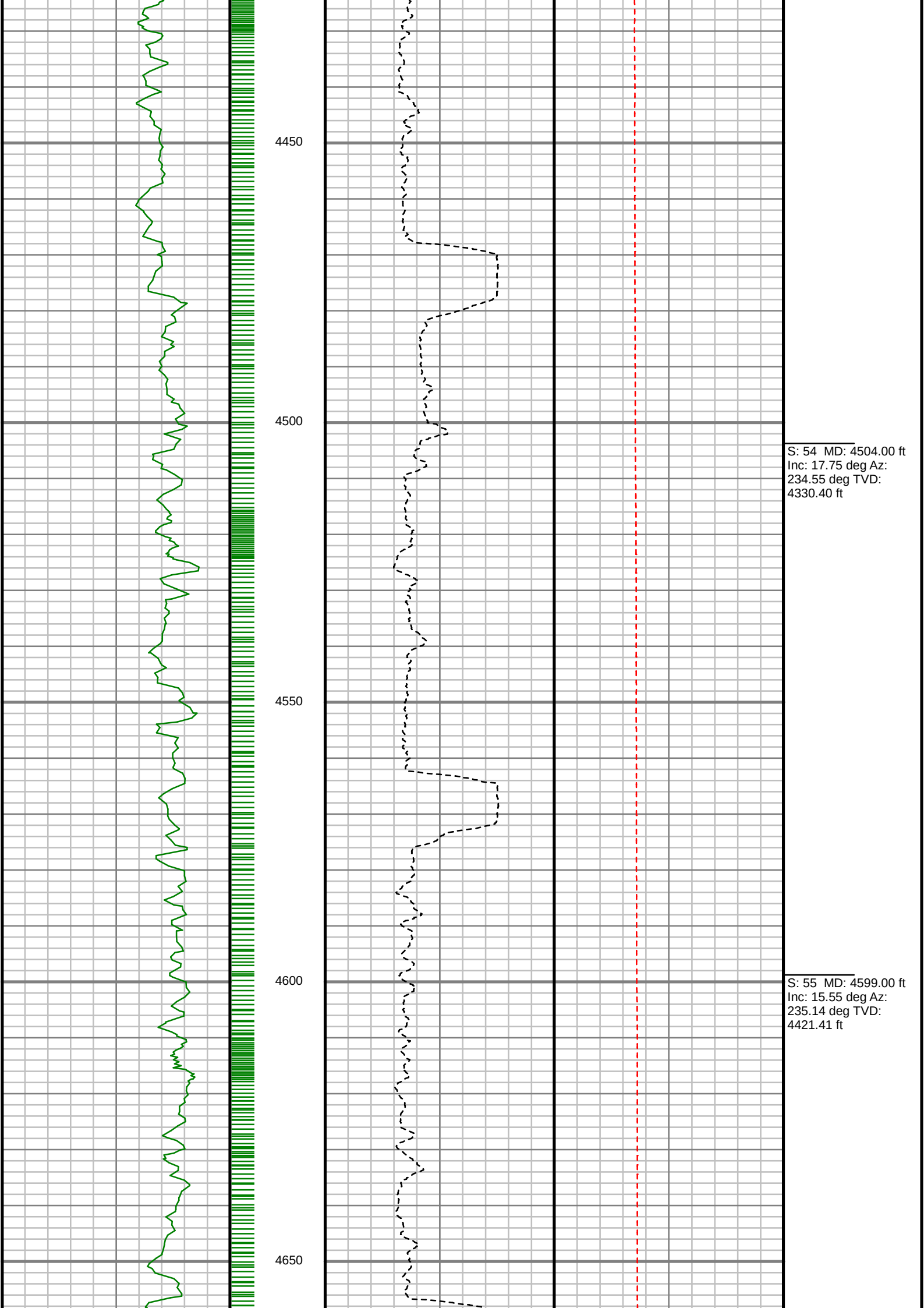

3300
3350
3400
3450
S: 41 MD: 3276.00 ft
Inc: 19.60 deg Az:
227.04 deg TVD:
3162.67 ft
S: 42 MD: 3370.00 ft
Inc: 19.82 deg Az:
228.84 deg TVD:
3251.16 ft
S: 43 MD: 3465.00 ft
Inc: 19.07 deg Az:
230.52 deg TVD:
3340.75 ft

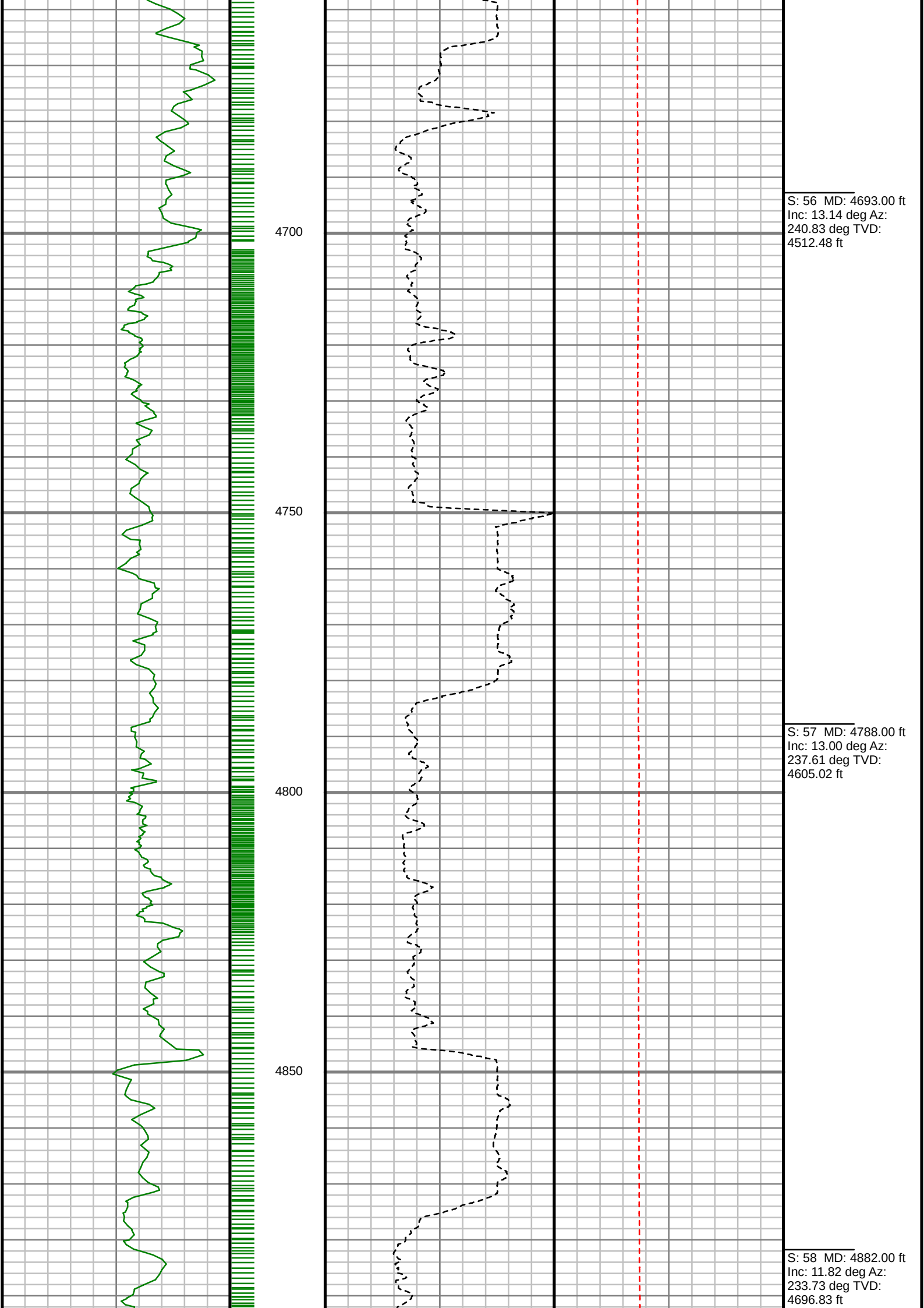

3500
3550
3600
3650
3700
S: 44 MD: 3559.00 ft Inc: 18.21 deg Az: 230.28 deg TVD: 3429.81 ft
S: 45 MD: 3654.00 ft Inc: 18.28 deg Az: 226.96 deg TVD: 3520.04 ft

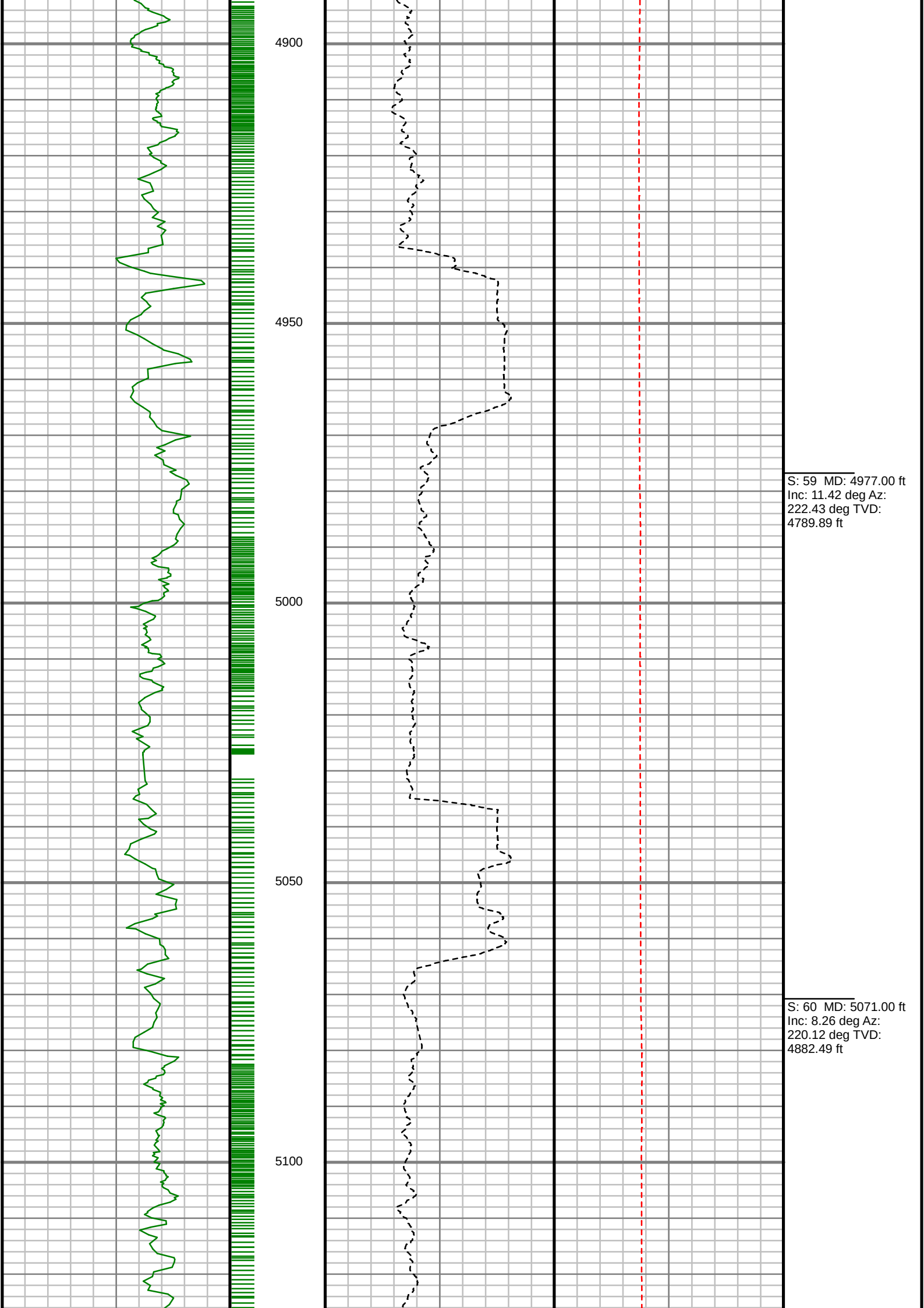

3750
3800
3850
3900
3950
S: 46 MD: 3748.00 ft
Inc: 17.26 deg Az:
227.26 deg TVD:
3609.55 ft
S: 47 MD: 3843.00 ft
Inc: 18.04 deg Az:
226.43 deg TVD:
3700.08 ft
S: 48 MD: 3937.00 ft
Inc: 17.05 deg Az:
223.56 deg TVD:
3789.71 ft

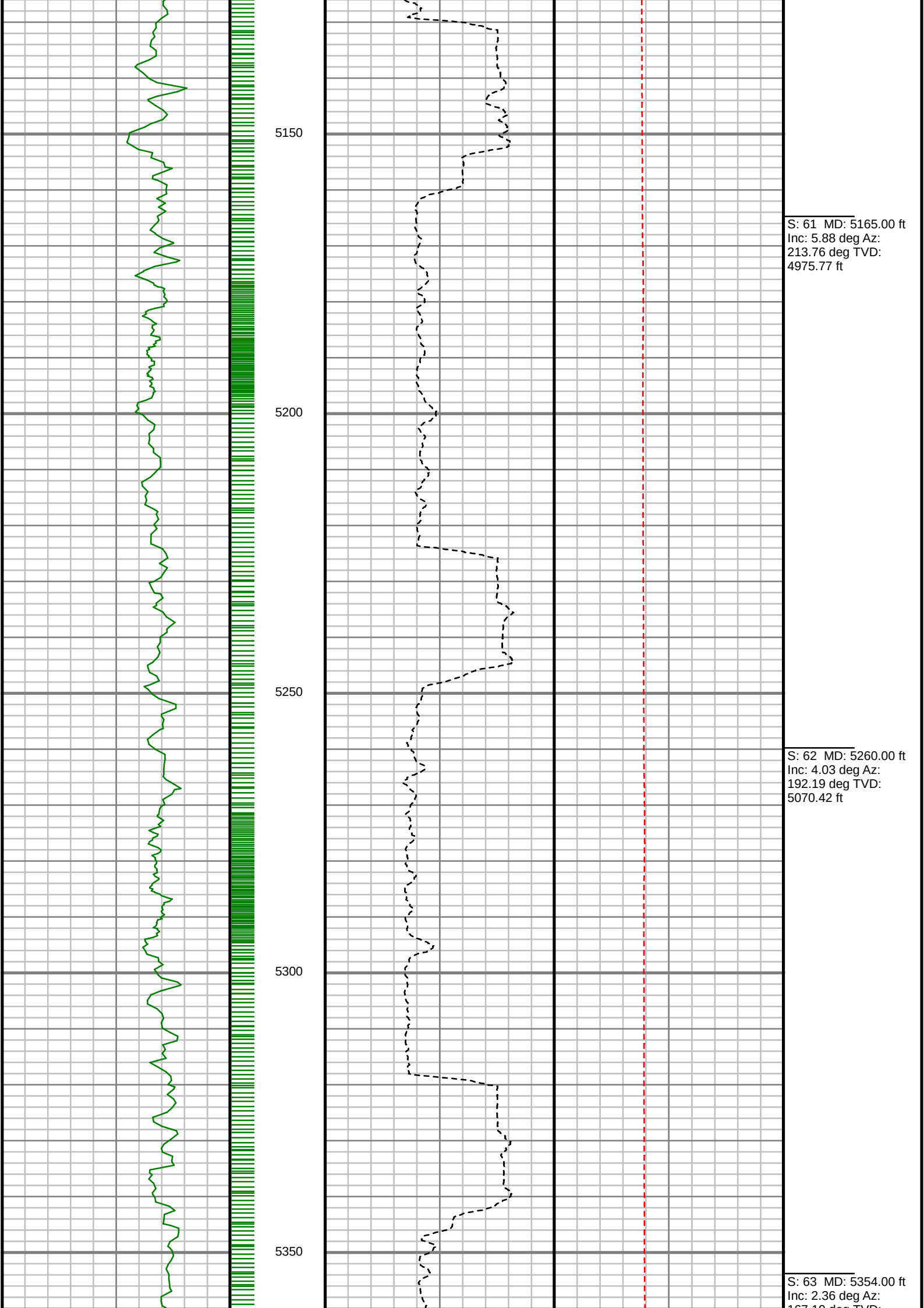

4000
4050
4100
4150
S: 49 MD: 4032.00 ft
Inc: 16.76 deg Az:
227.15 deg TVD:
3880.61 ft
S: 50 MD: 4126.00 ft
Inc: 16.84 deg Az:
227.07 deg TVD:
3970.60 ft

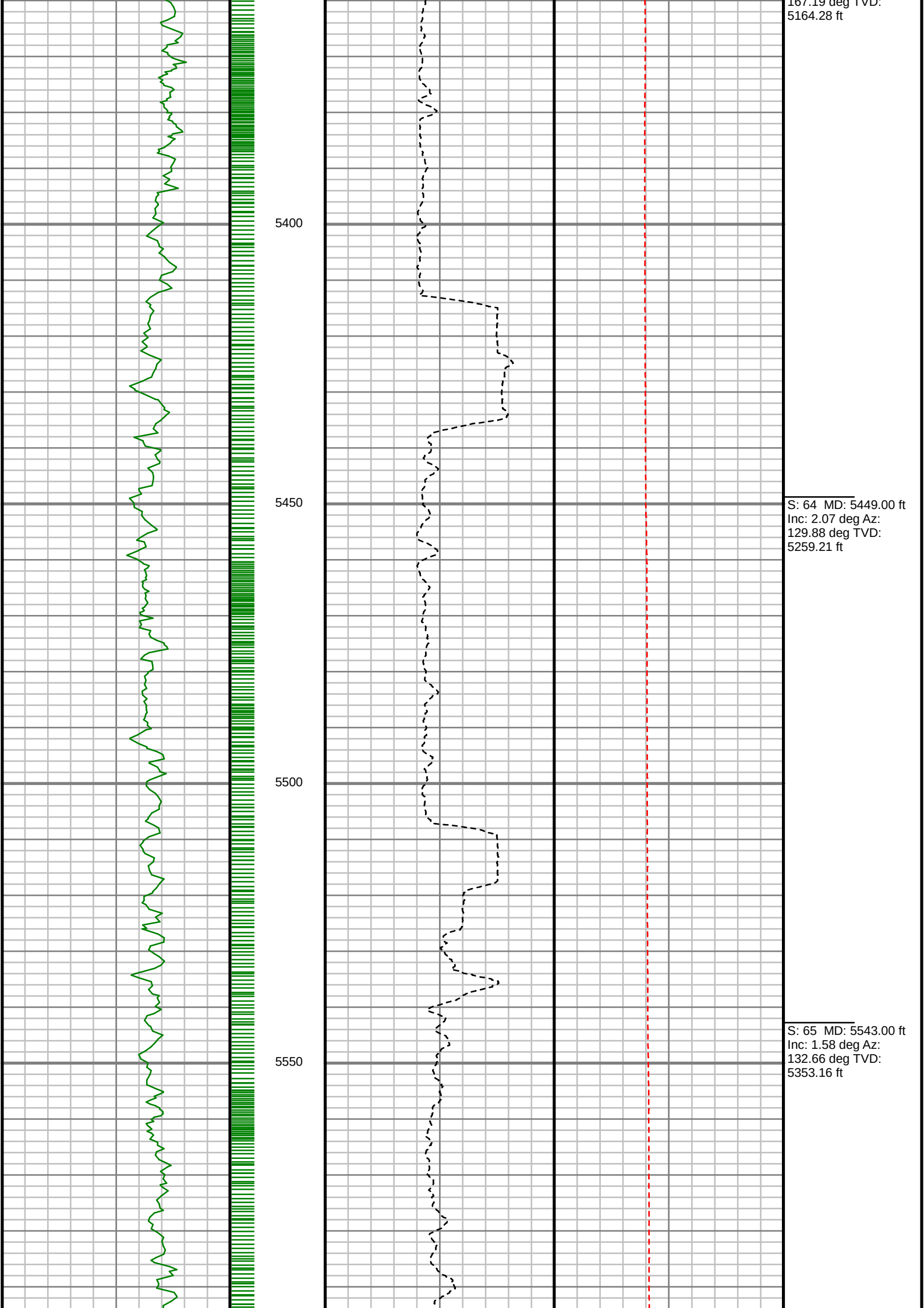

4200
4250
4300
4350
4400
S: 51 MD: 4221.00 ft
Inc: 17.26 deg Az:
233.21 deg TVD:
4061.43 ft
S: 52 MD: 4315.00 ft
Inc: 17.91 deg Az:
235.65 deg TVD:
4151.04 ft
S: 53 MD: 4410.00 ft
Inc: 18.91 deg Az:
234.94 deg TVD:
4241.17 ft

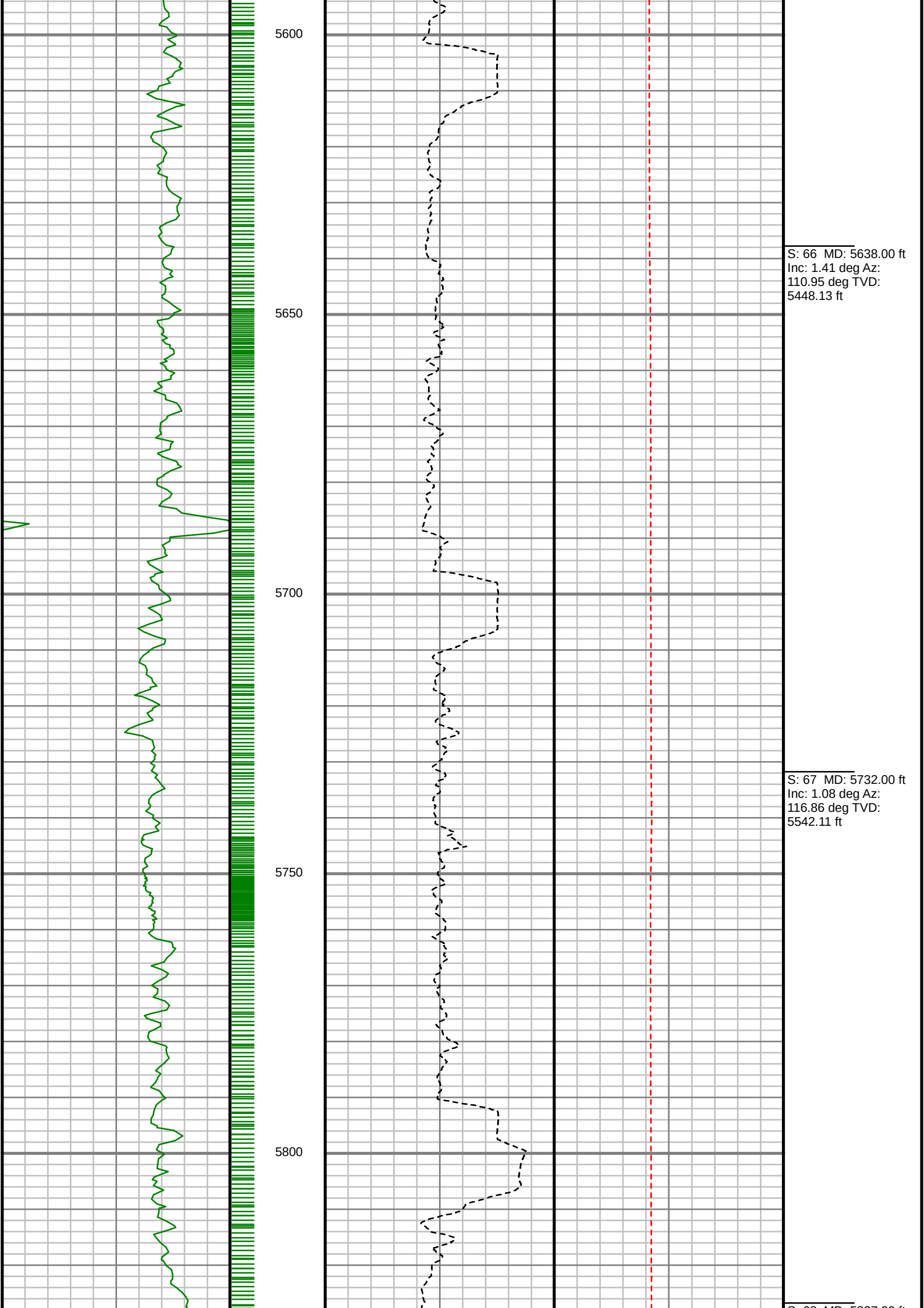

4450
4500
4550
4600
4650
S: 54 MD: 4504.00 ft
Inc: 17.75 deg Az:
234.55 deg TVD:
4330.40 ft
S: 55 MD: 4599.00 ft
Inc: 15.55 deg Az:
235.14 deg TVD:
4421.41 ft

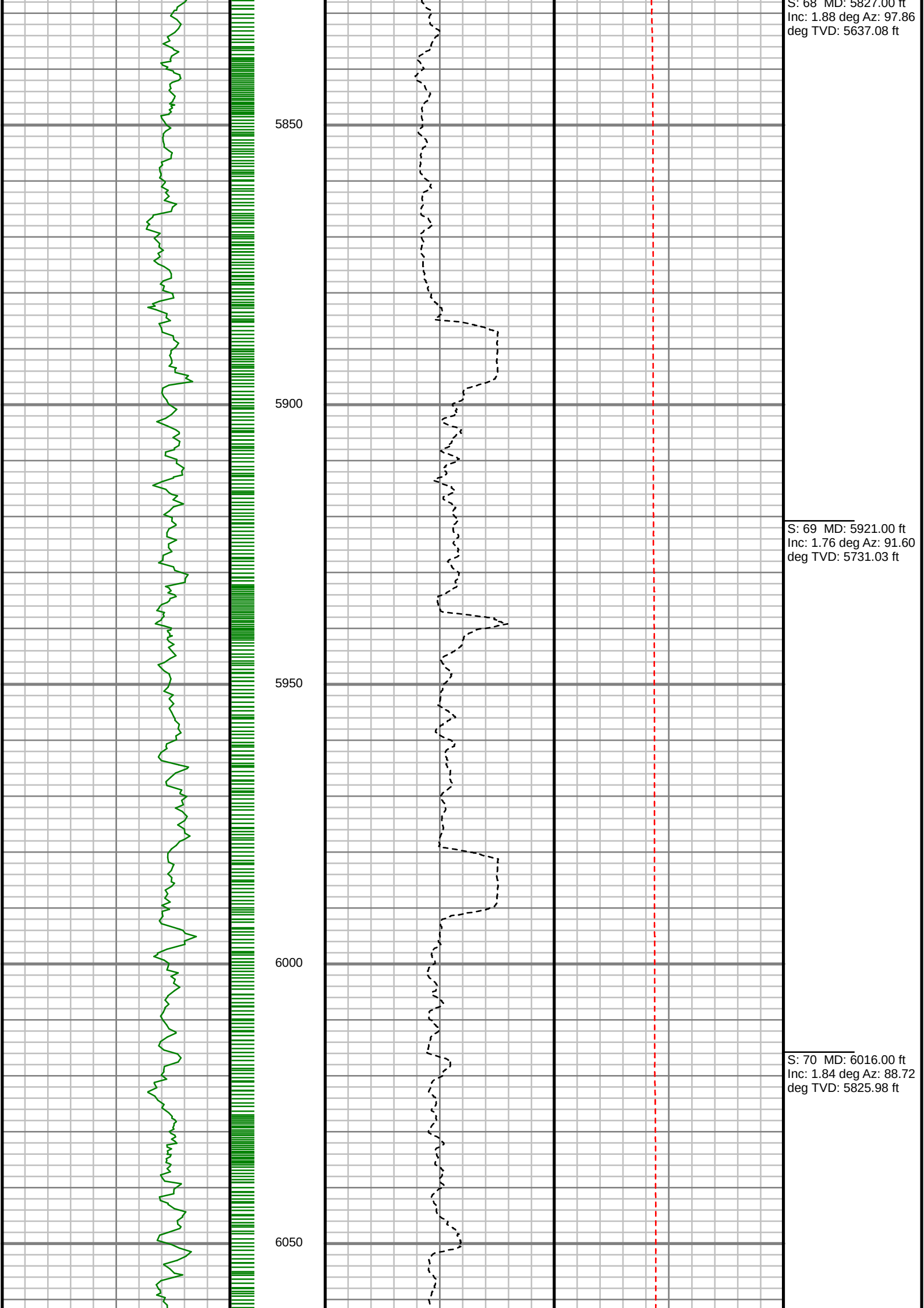

4700
4750
4800
4850
S: 56 MD: 4693.00 ft
Inc: 13.14 deg Az:
240.83 deg TVD:
4512.48 ft
S: 57 MD: 4788.00 ft
Inc: 13.00 deg Az:
237.61 deg TVD:
4605.02 ft
S: 58 MD: 4882.00 ft
Inc: 11.82 deg Az:
233.73 deg TVD:
4696.83 ft

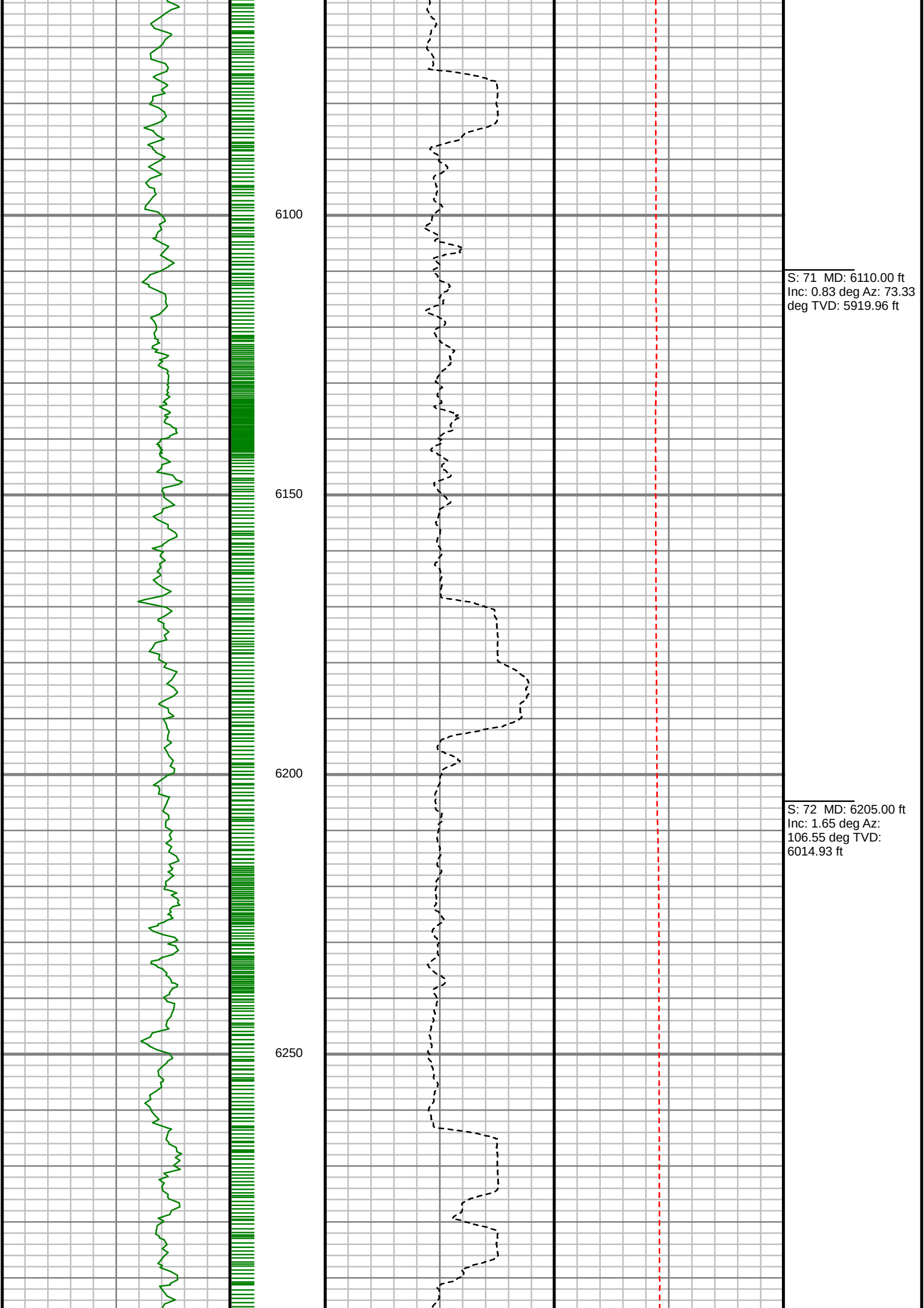

4900
4950
5000
5050
5100
S: 59 MD: 4977.00 ft
Inc: 11.42 deg Az:
222.43 deg TVD:
4789.89 ft
S: 60 MD: 5071.00 ft
Inc: 8.26 deg Az:
220.12 deg TVD:
4882.49 ft

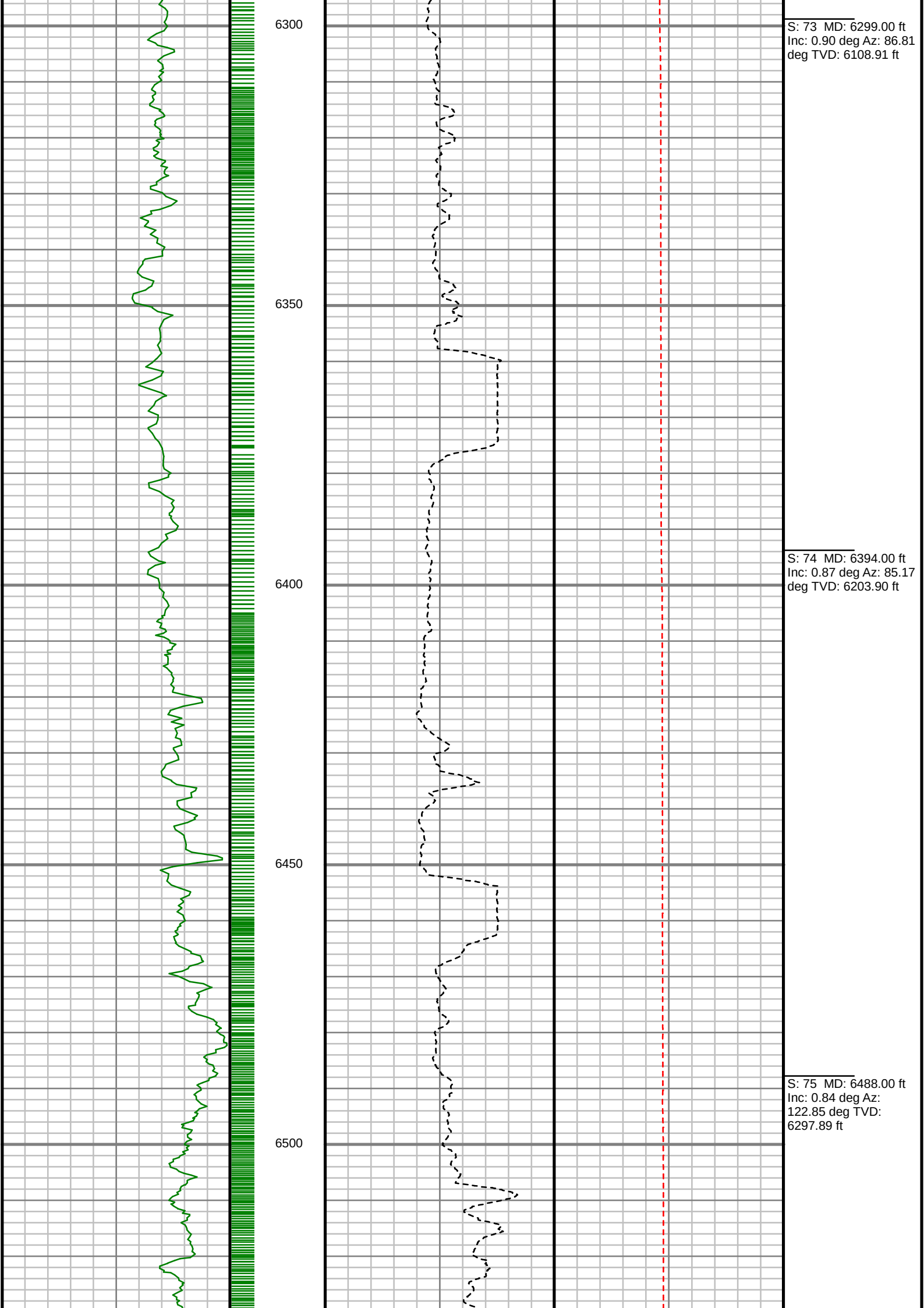

5150
5200
5250
5300
5350
S: 61 MD: 5165.00 ft
Inc: 5.88 deg Az:
213.76 deg TVD:
4975.77 ft
S: 62 MD: 5260.00 ft
Inc: 4.03 deg Az:
192.19 deg TVD:
5070.42 ft
S: 63 MD: 5354.00 ft
Inc: 2.36 deg Az:

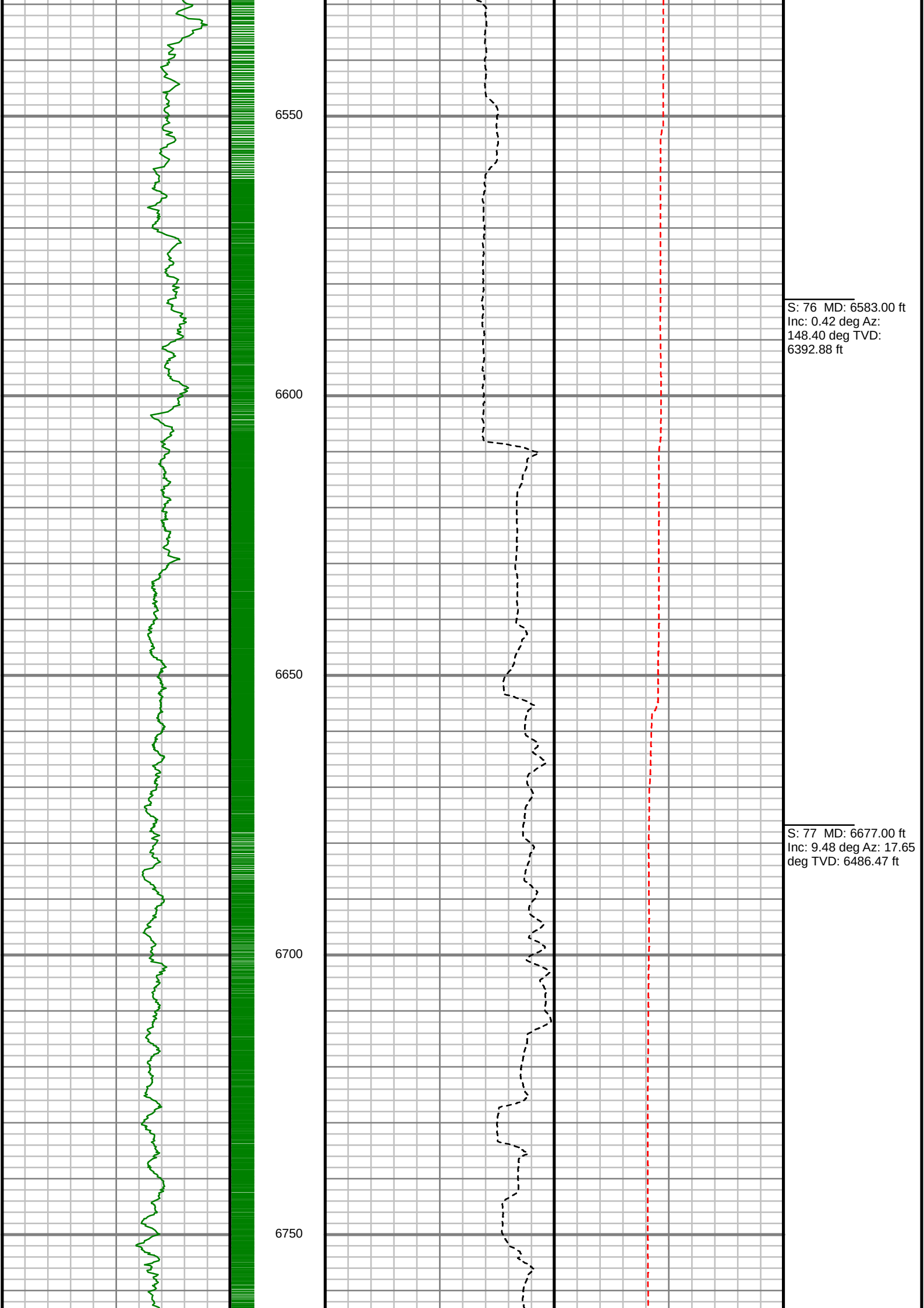

167.19 deg TVD:
5164.28 ft
5400
5450
S: 64 MD: 5449.00 ft
Inc: 2.07 deg Az:
129.88 deg TVD:
5259.21 ft
5500
S: 65 MD: 5543.00 ft
Inc: 1.58 deg Az:
132.66 deg TVD:
5353.16 ft
5550

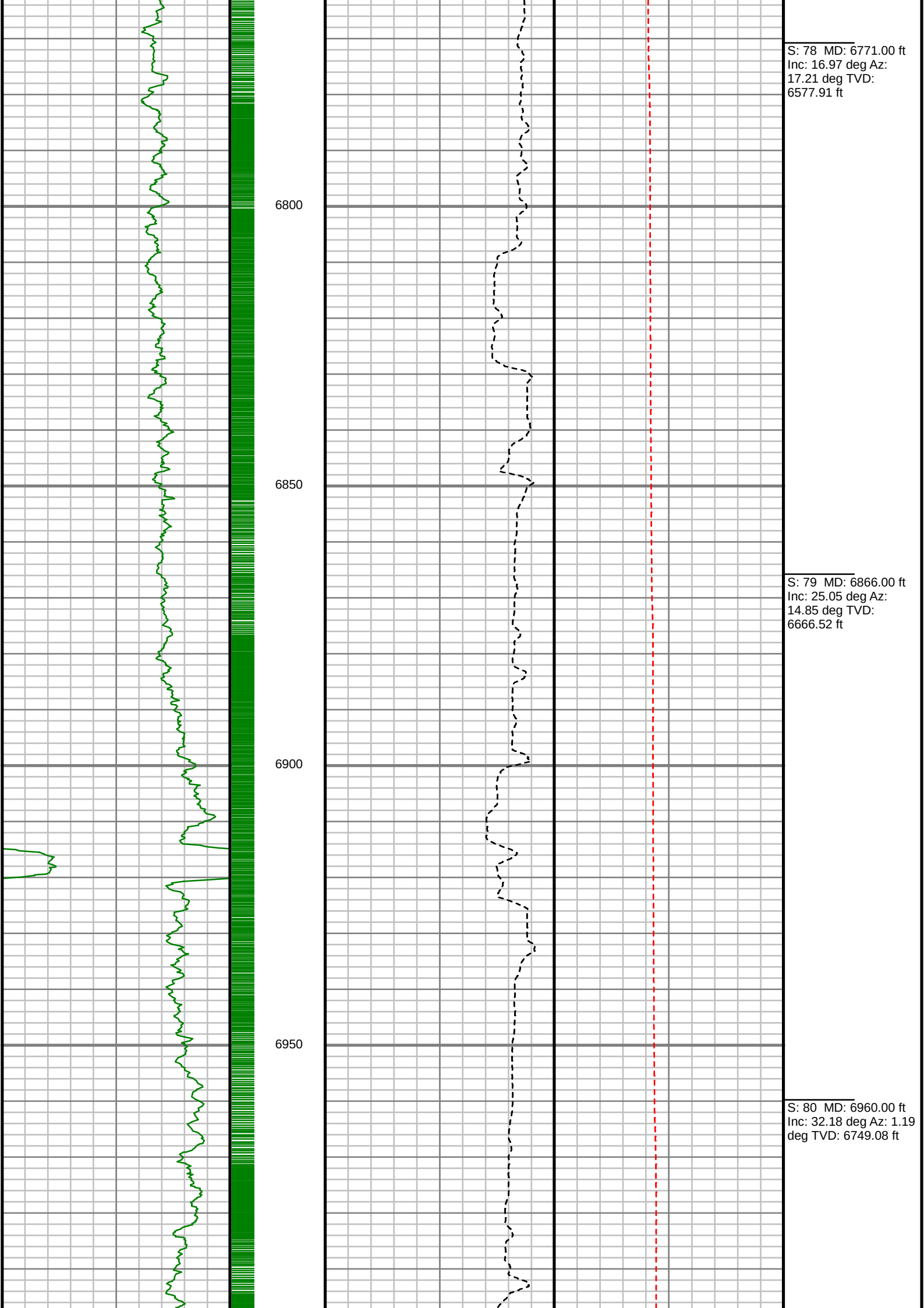

5600
5650
5700
5750
5800
S: 66 MD: 5638.00 ft
Inc: 1.41 deg Az:
110.95 deg TVD:
5448.13 ft
S: 67 MD: 5732.00 ft
Inc: 1.08 deg Az:
116.86 deg TVD:
5542.11 ft

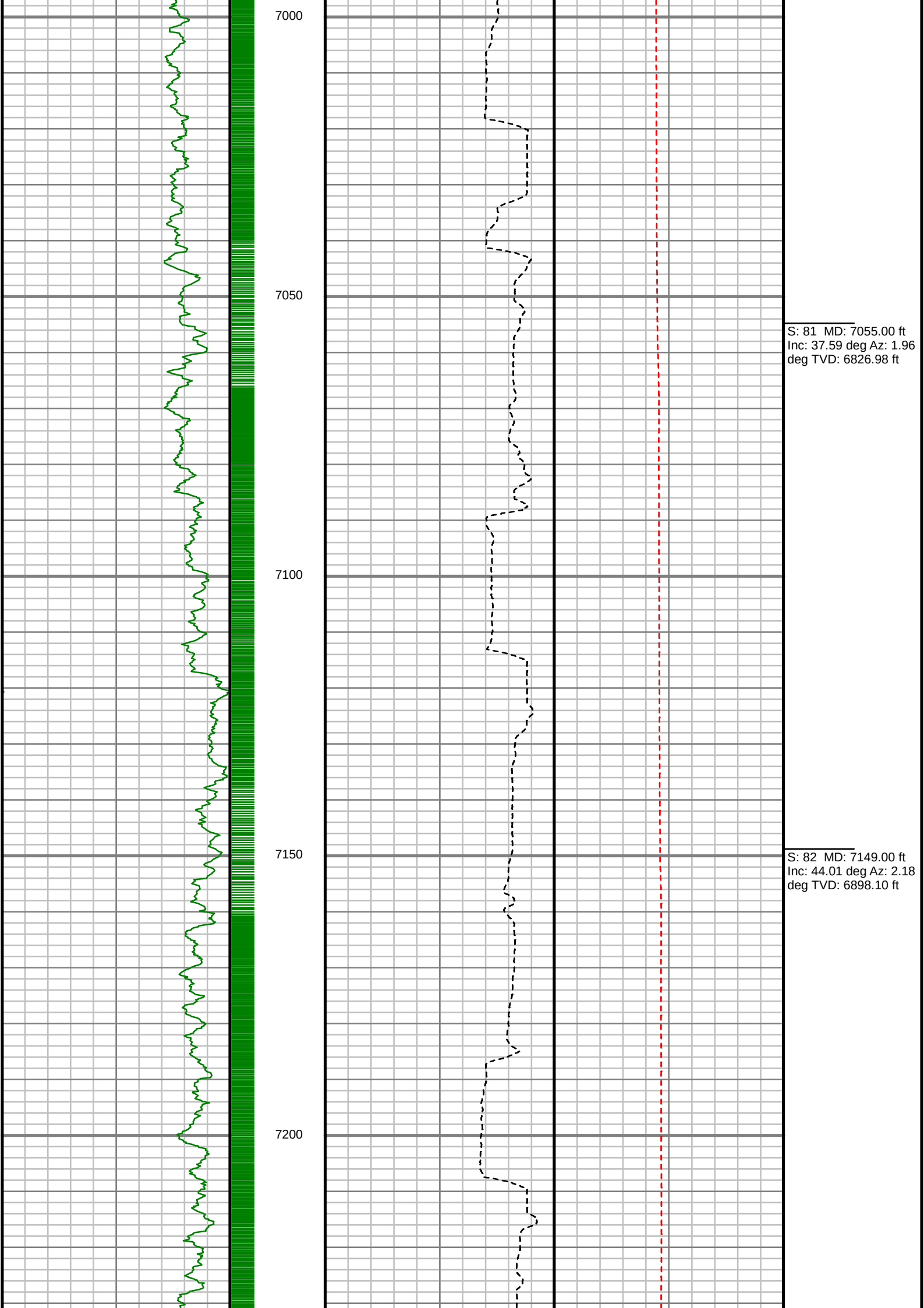

S: 68 MD: 5827.00 ft
Inc: 1.88 deg Az: 97.86
deg TVD: 5637.08 ft
5850
5900
S: 69 MD: 5921.00 ft
Inc: 1.76 deg Az: 91.60
deg TVD: 5731.03 ft
5950
6000
S: 70 MD: 6016.00 ft
Inc: 1.84 deg Az: 88.72
deg TVD: 5825.98 ft
6050

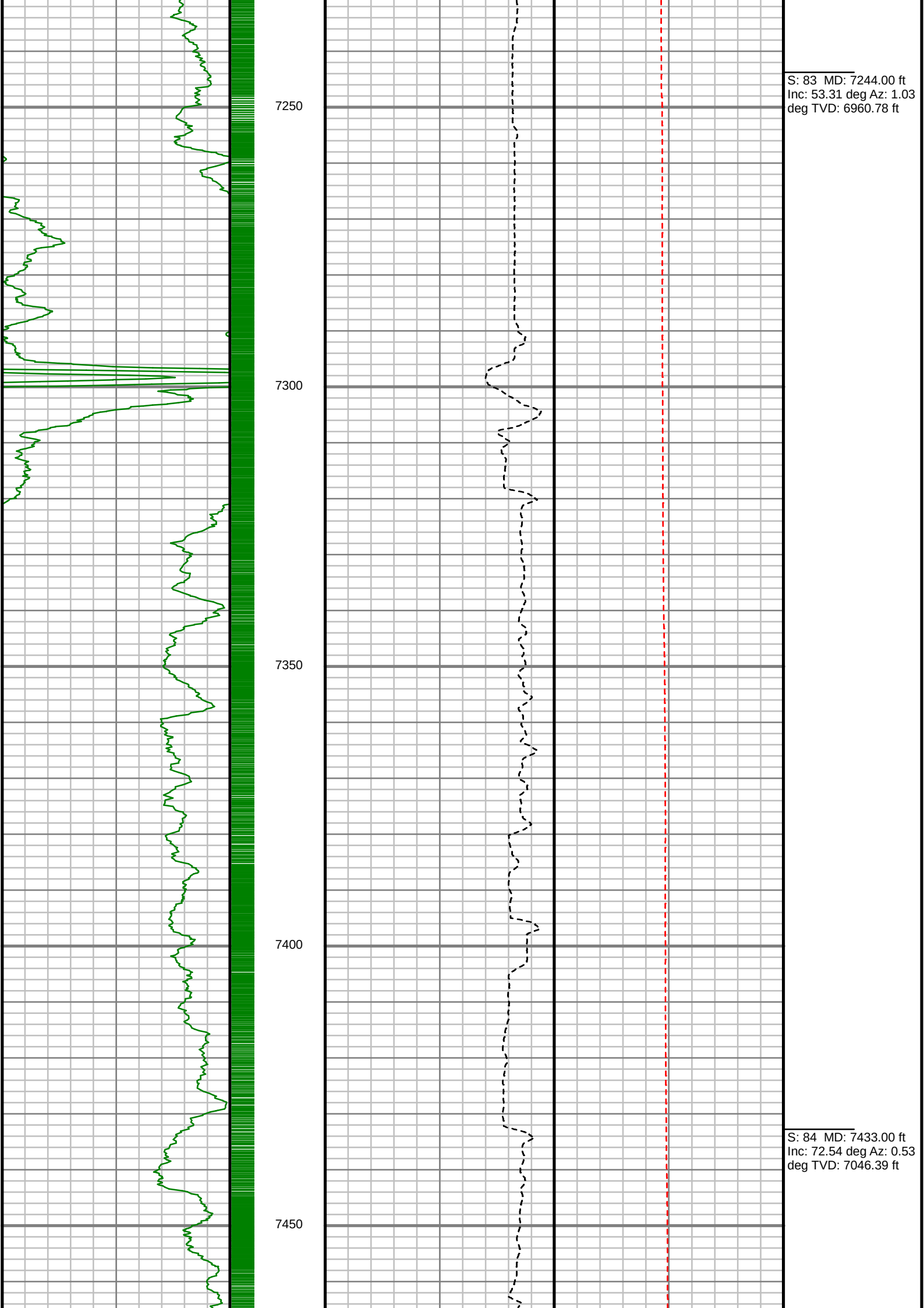

6100
6150
6200
6250
S: 71 MD: 6110.00 ft
Inc: 0.83 deg Az: 73.33
deg TVD: 5919.96 ft
S: 72 MD: 6205.00 ft
Inc: 1.65 deg Az:
106.55 deg TVD:
6014.93 ft

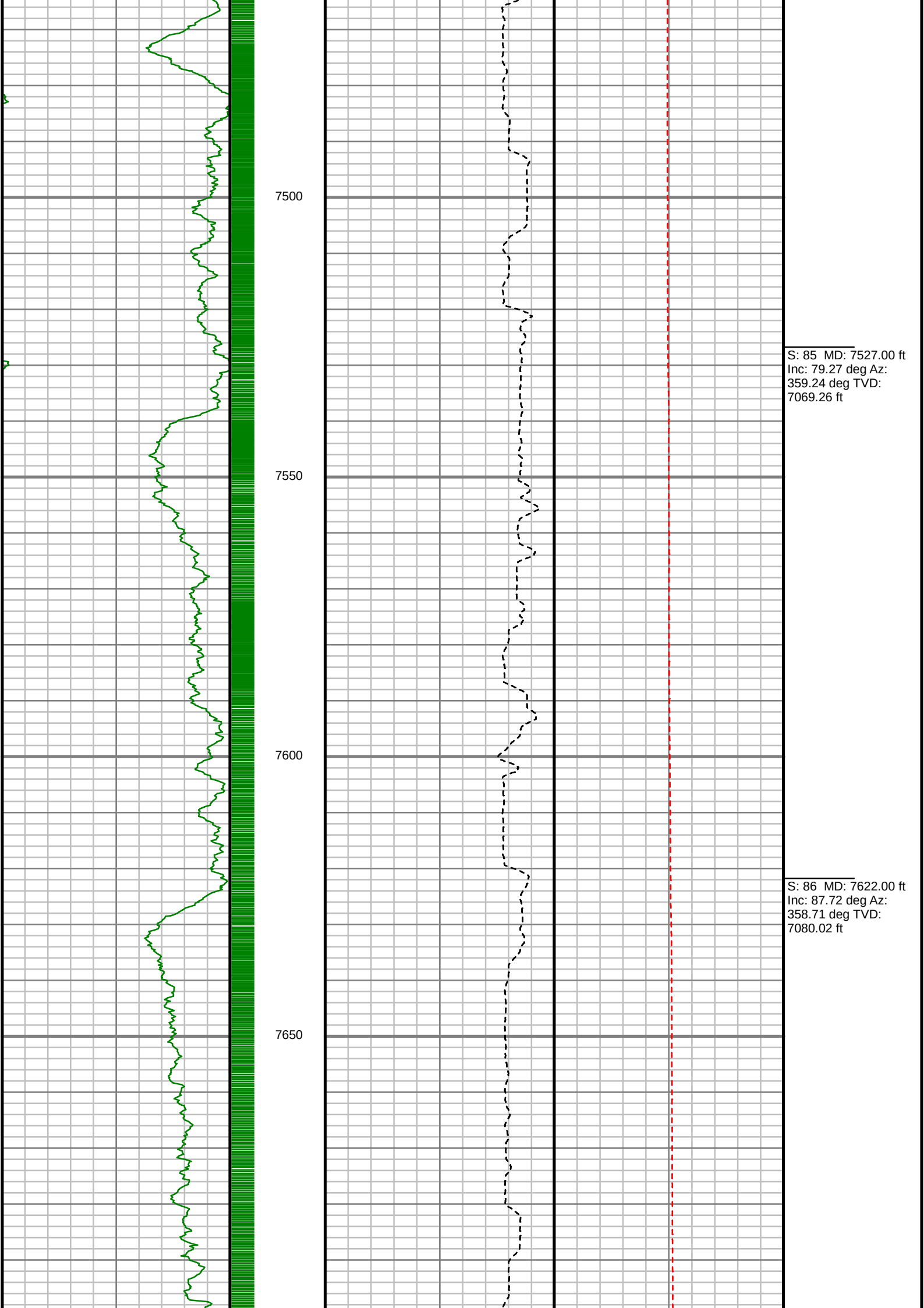

6300
6350
6400
6450
6500
S: 73 MD: 6299.00 ft
Inc: 0.90 deg Az: 86.81
deg TVD: 6108.91 ft
S: 74 MD: 6394.00 ft
Inc: 0.87 deg Az: 85.17
deg TVD: 6203.90 ft
S: 75 MD: 6488.00 ft
Inc: 0.84 deg Az:
122.85 deg TVD:
6297.89 ft

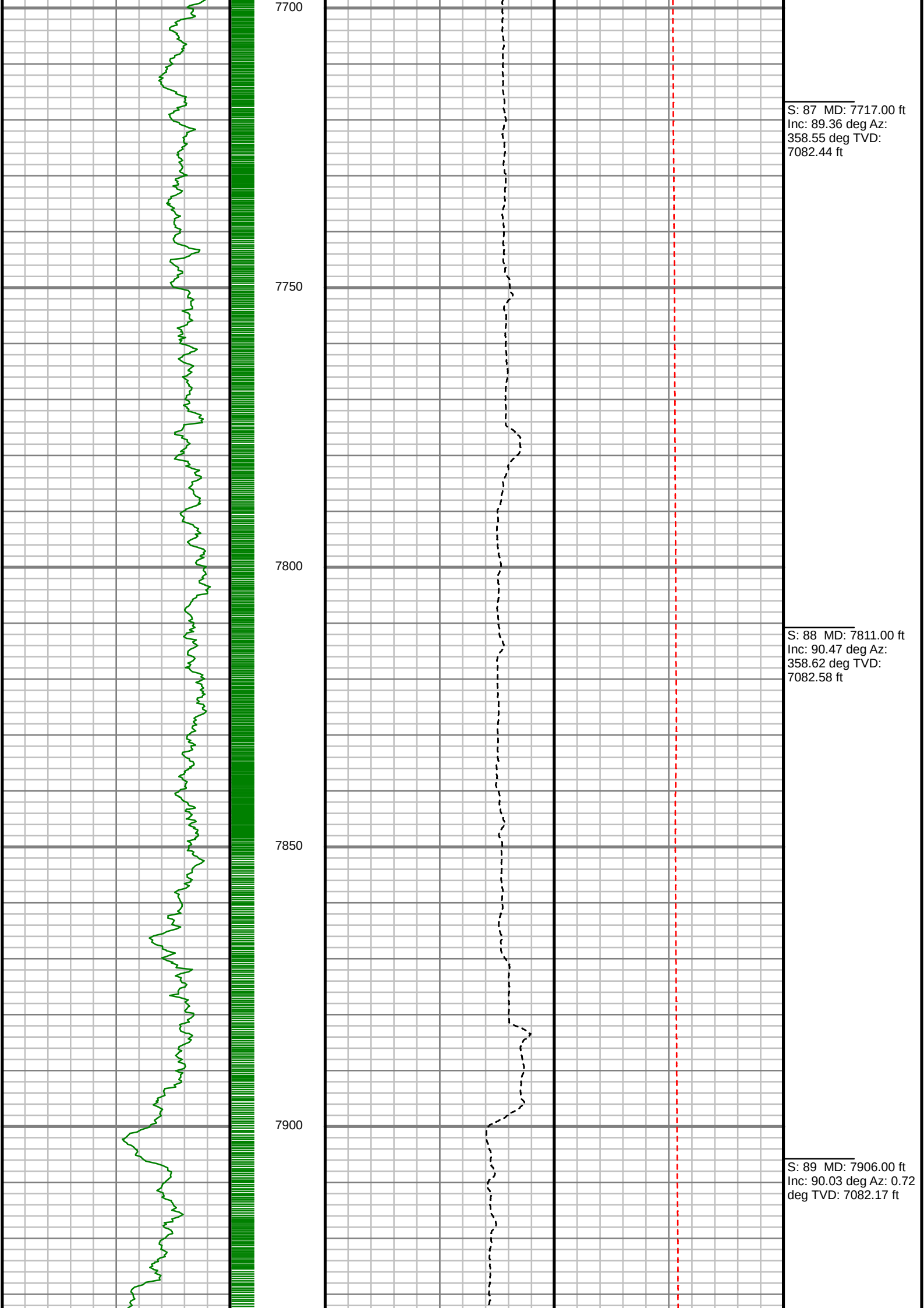

6550
6600
6650
6700
6750
S: 76 MD: 6583.00 ft
Inc: 0.42 deg Az:
148.40 deg TVD:
6392.88 ft
S: 77 MD: 6677.00 ft
Inc: 9.48 deg Az: 17.65
deg TVD: 6486.47 ft

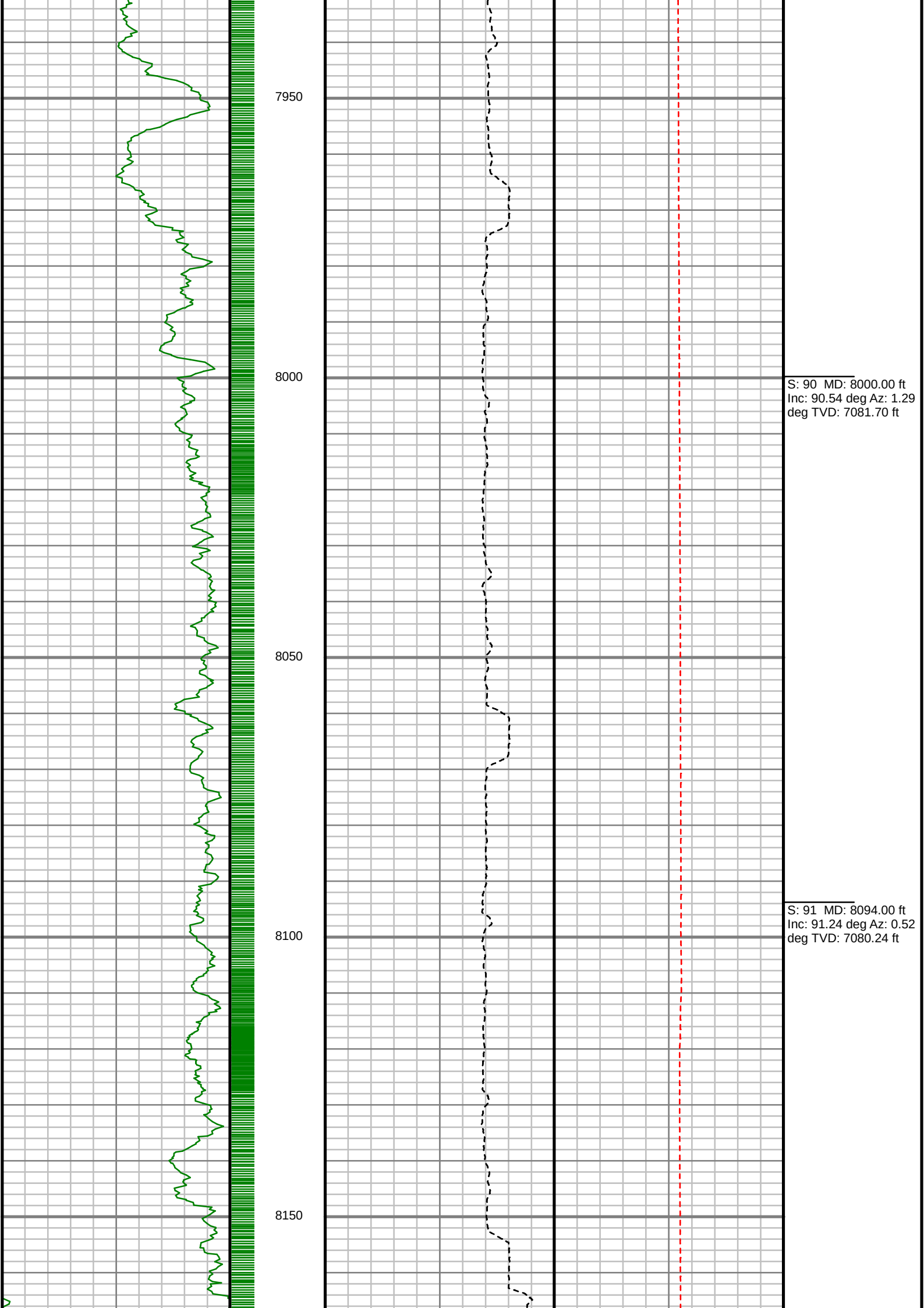

6800
6850
6900
6950
S: 78 MD: 6771.00 ft Inc: 16.97 deg Az: 17.21 deg TVD: 6577.91 ft
S: 79 MD: 6866.00 ft Inc: 25.05 deg Az: 14.85 deg TVD: 6666.52 ft
S: 80 MD: 6960.00 ft Inc: 32.18 deg Az: 1.19 deg TVD: 6749.08 ft

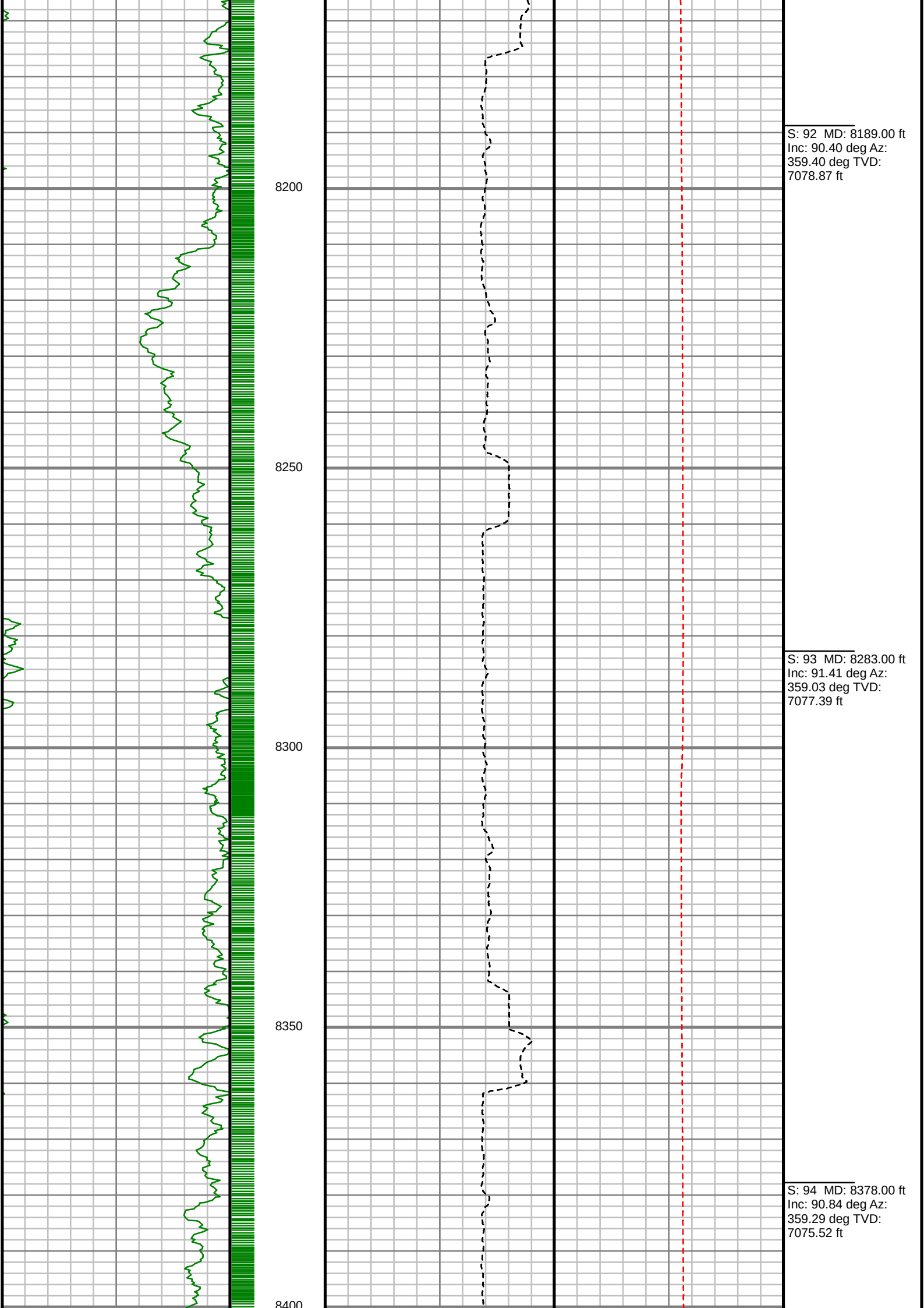

7000
7050
7100
7150
7200
S: 81 MD: 7055.00 ft
Inc: 37.59 deg Az: 1.96
deg TVD: 6826.98 ft
S: 82 MD: 7149.00 ft
Inc: 44.01 deg Az: 2.18
deg TVD: 6898.10 ft

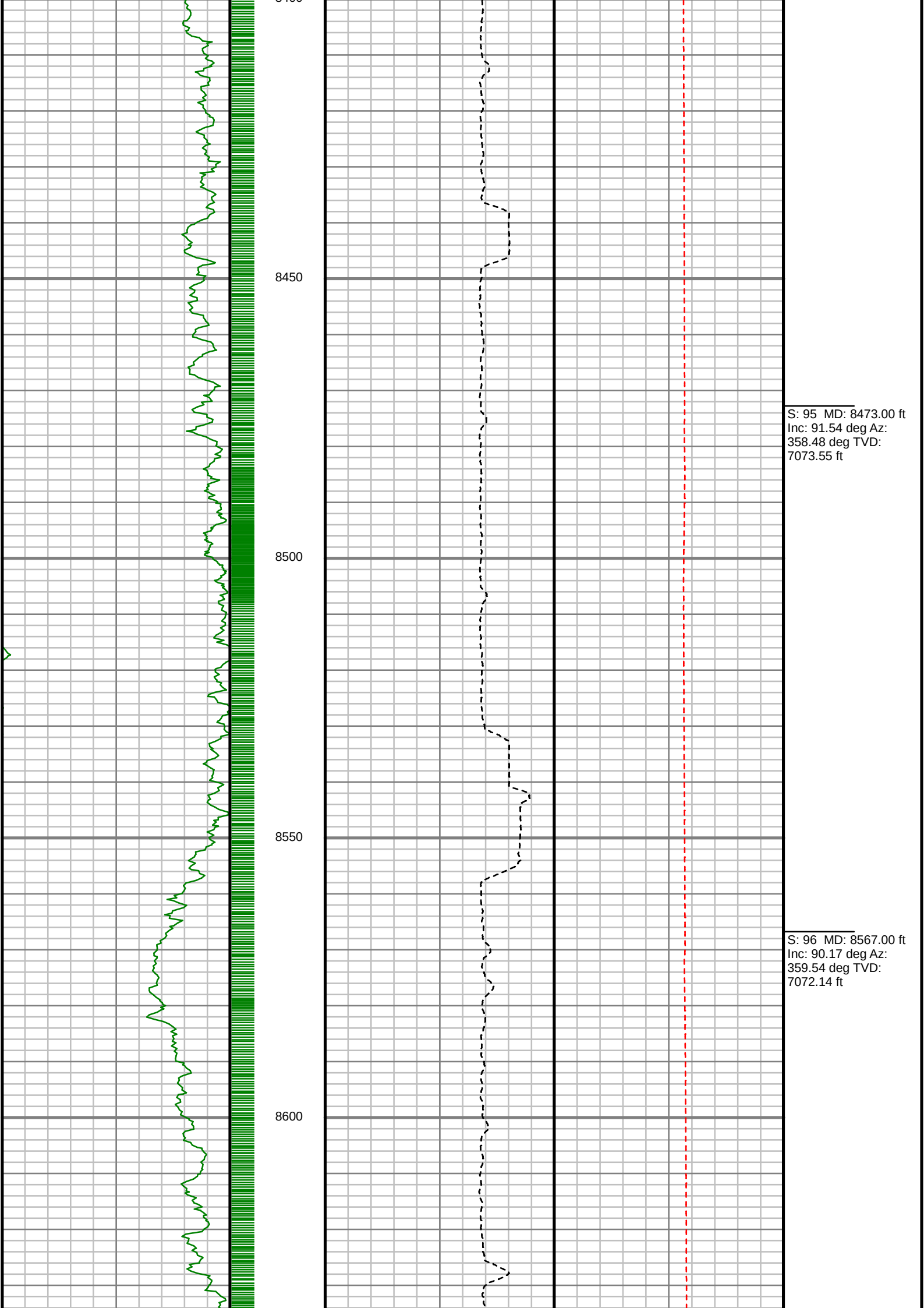

7250
7300
7350
7400
7450
S: 83 MD: 7244.00 ft
Inc: 53.31 deg Az: 1.03
deg TVD: 6960.78 ft
S: 84 MD: 7433.00 ft
Inc: 72.54 deg Az: 0.53
deg TVD: 7046.39 ft

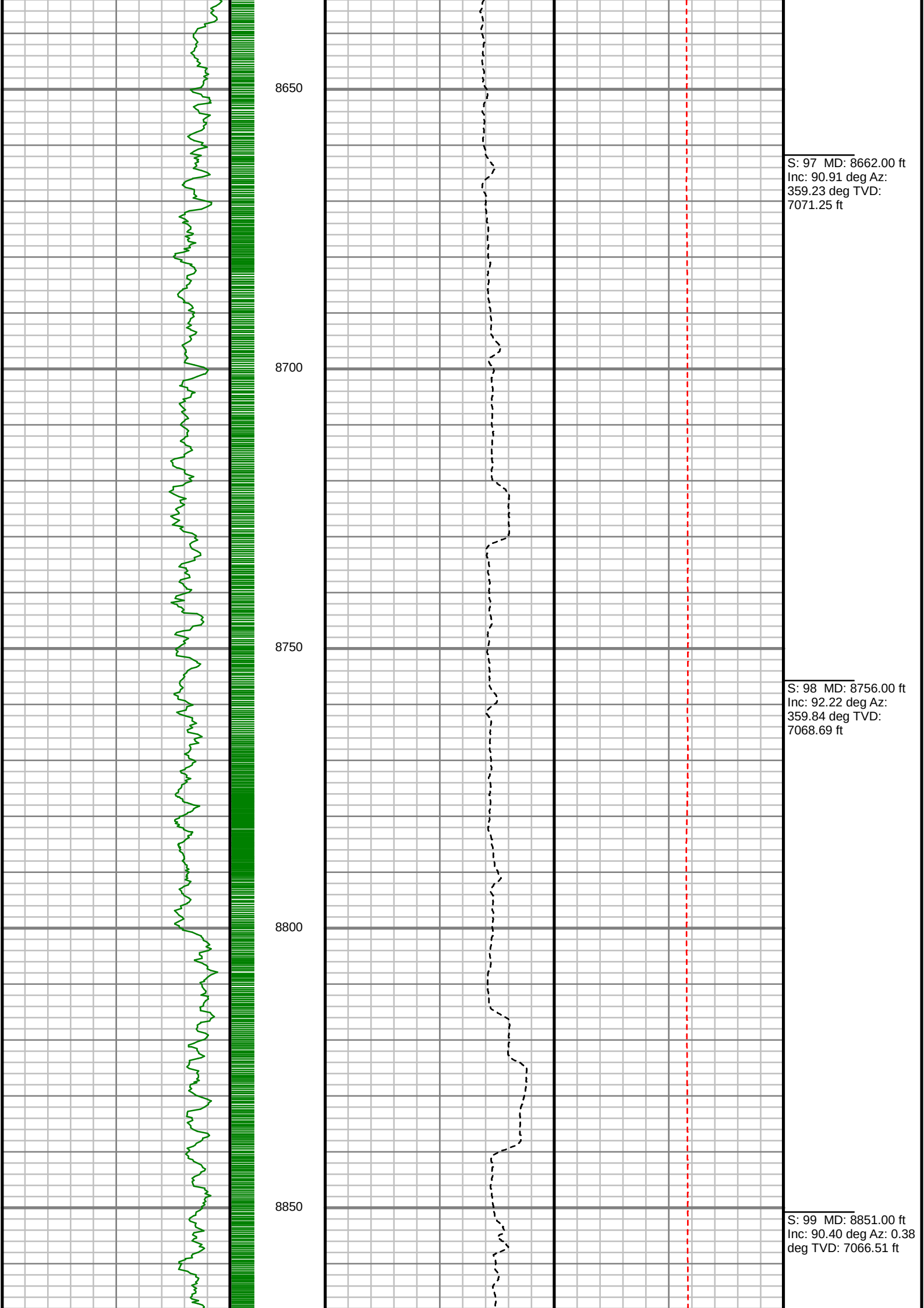

7500
7550
7600
7650
S: 85 MD: 7527.00 ft
Inc: 79.27 deg Az:
359.24 deg TVD:
7069.26 ft
S: 86 MD: 7622.00 ft
Inc: 87.72 deg Az:
358.71 deg TVD:
7080.02 ft

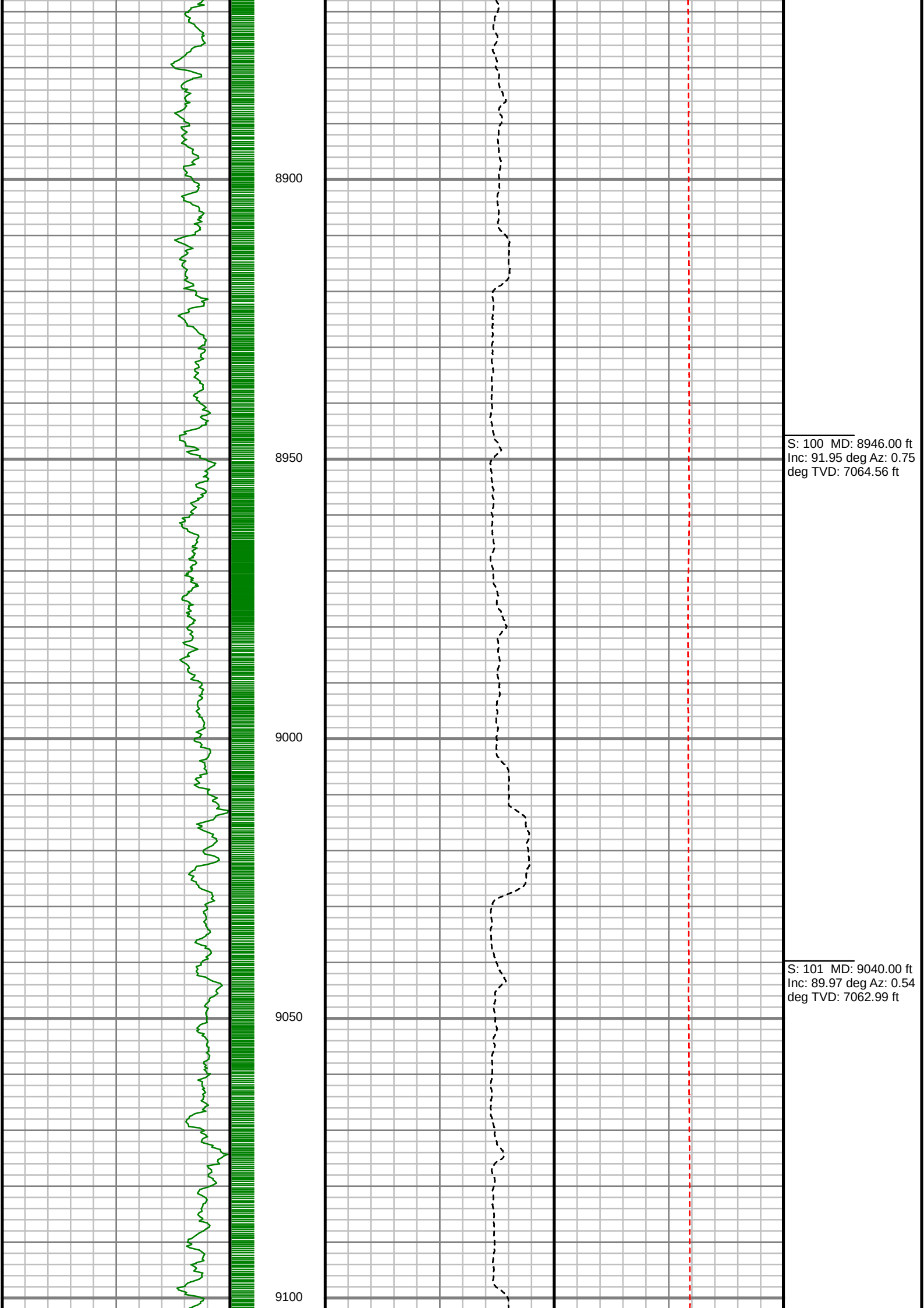

7700
7750
7800
7850
7900
S: 87 MD: 7717.00 ft Inc: 89.36 deg Az: 358.55 deg TVD: 7082.44 ft
S: 88 MD: 7811.00 ft Inc: 90.47 deg Az: 358.62 deg TVD: 7082.58 ft
S: 89 MD: 7906.00 ft Inc: 90.03 deg Az: 0.72 deg TVD: 7082.17 ft

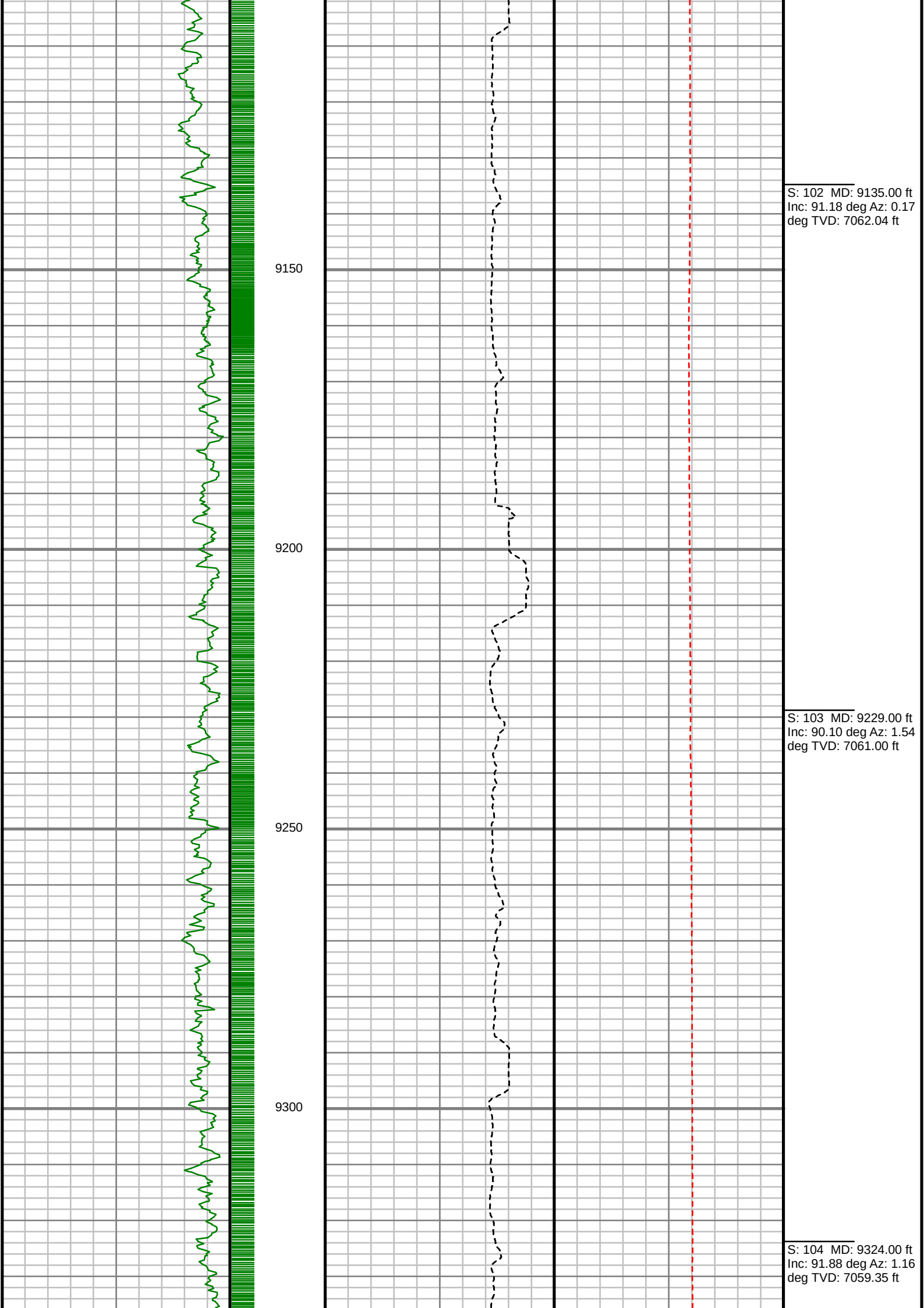

7950
8000
8050
8100
8150
S: 90 MD: 8000.00 ft
Inc: 90.54 deg Az: 1.29
deg TVD: 7081.70 ft
S: 91 MD: 8094.00 ft
Inc: 91.24 deg Az: 0.52
deg TVD: 7080.24 ft

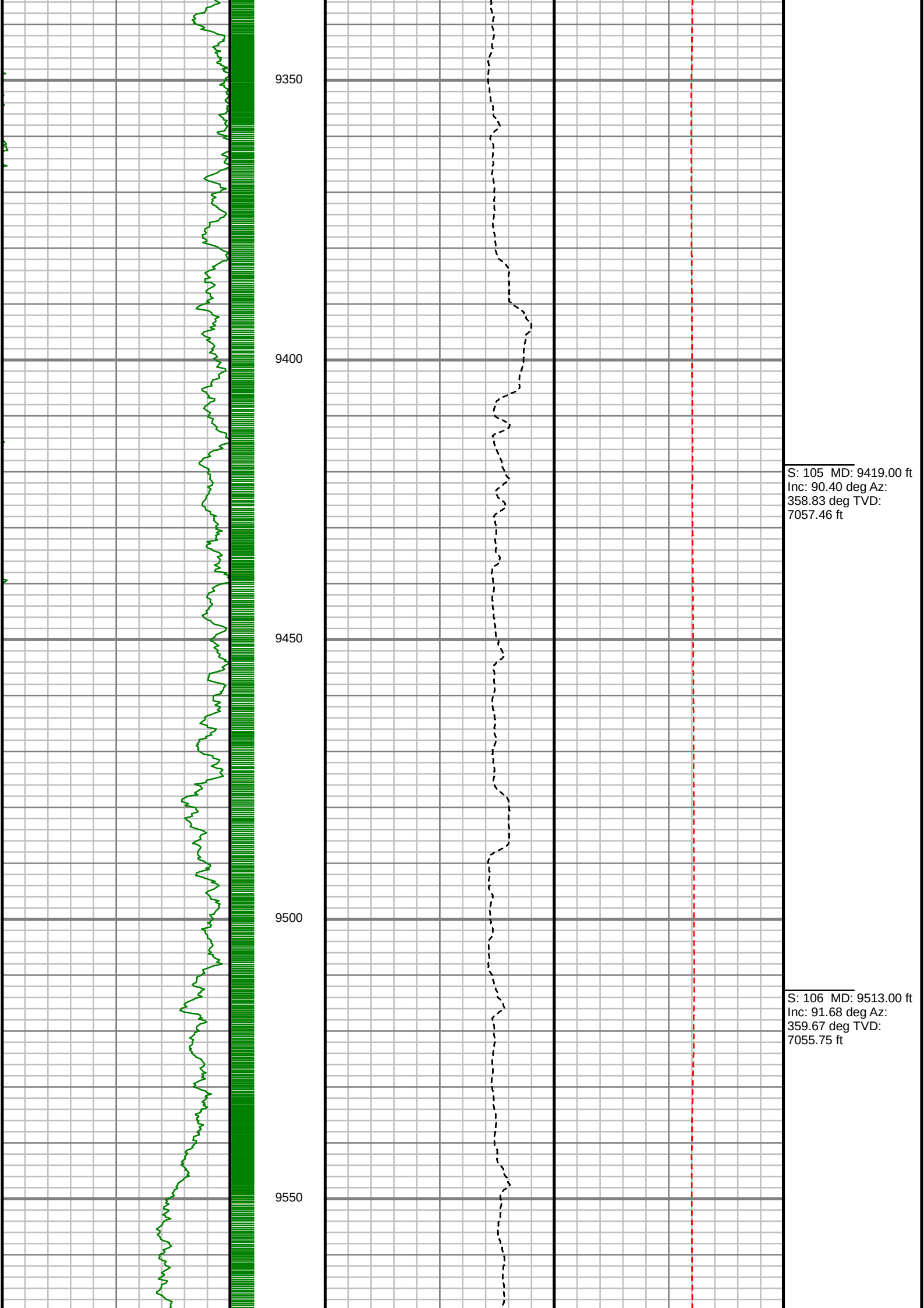

8200
8250
8300
8350
8400
S: 92 MD: 8189.00 ft
Inc: 90.40 deg Az:
359.40 deg TVD:
7078.87 ft
S: 93 MD: 8283.00 ft
Inc: 91.41 deg Az:
359.03 deg TVD:
7077.39 ft
S: 94 MD: 8378.00 ft
Inc: 90.84 deg Az:
359.29 deg TVD:
7075.52 ft

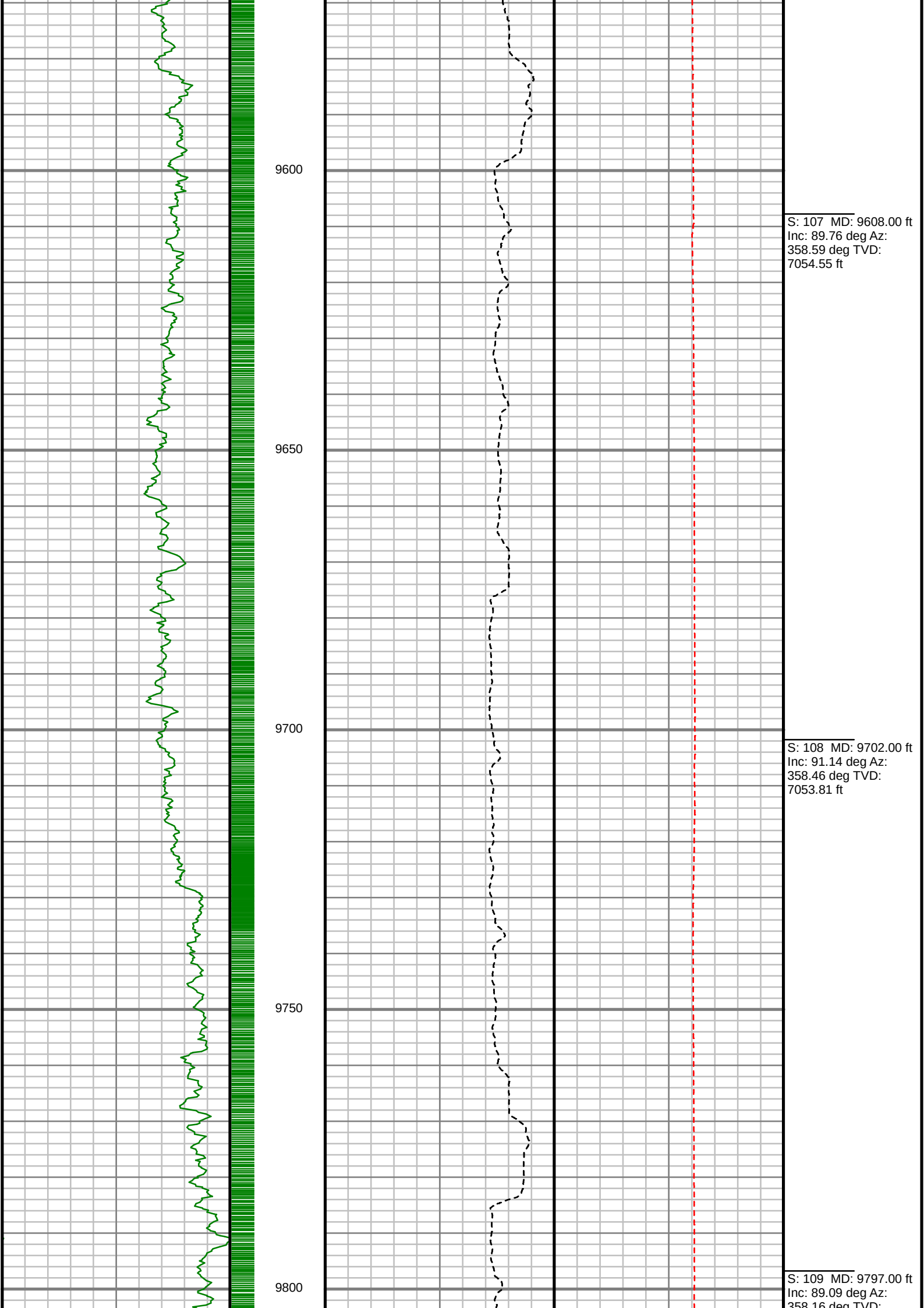

8450
8500
8550
8600
S: 95 MD: 8473.00 ft
Inc: 91.54 deg Az:
358.48 deg TVD:
7073.55 ft
S: 96 MD: 8567.00 ft
Inc: 90.17 deg Az:
359.54 deg TVD:
7072.14 ft

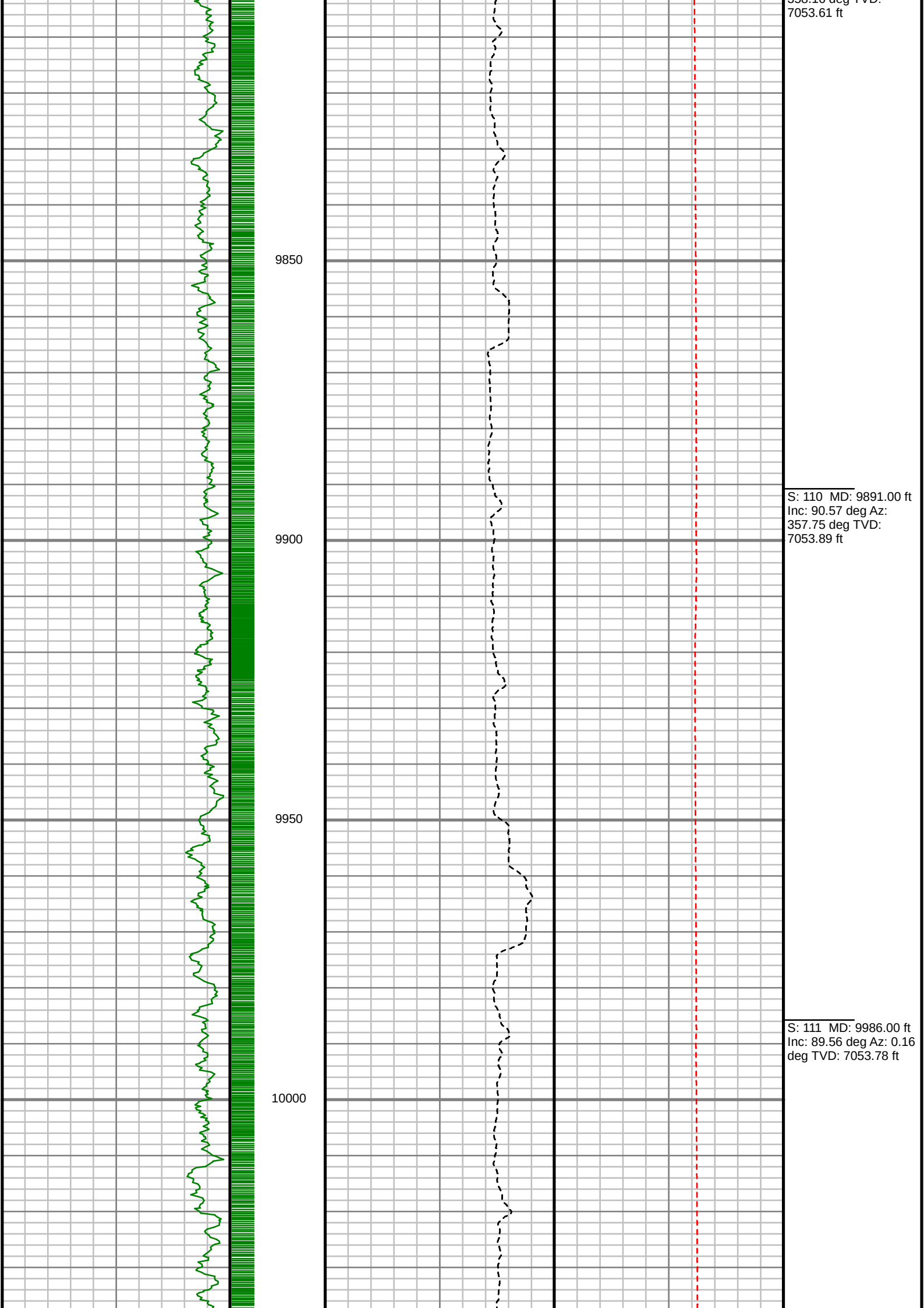

8650
8700
8750
8800
8850
S: 97 MD: 8662.00 ft Inc: 90.91 deg Az: 359.23 deg TVD: 7071.25 ft
S: 98 MD: 8756.00 ft Inc: 92.22 deg Az: 359.84 deg TVD: 7068.69 ft
S: 99 MD: 8851.00 ft Inc: 90.40 deg Az: 0.38 deg TVD: 7066.51 ft

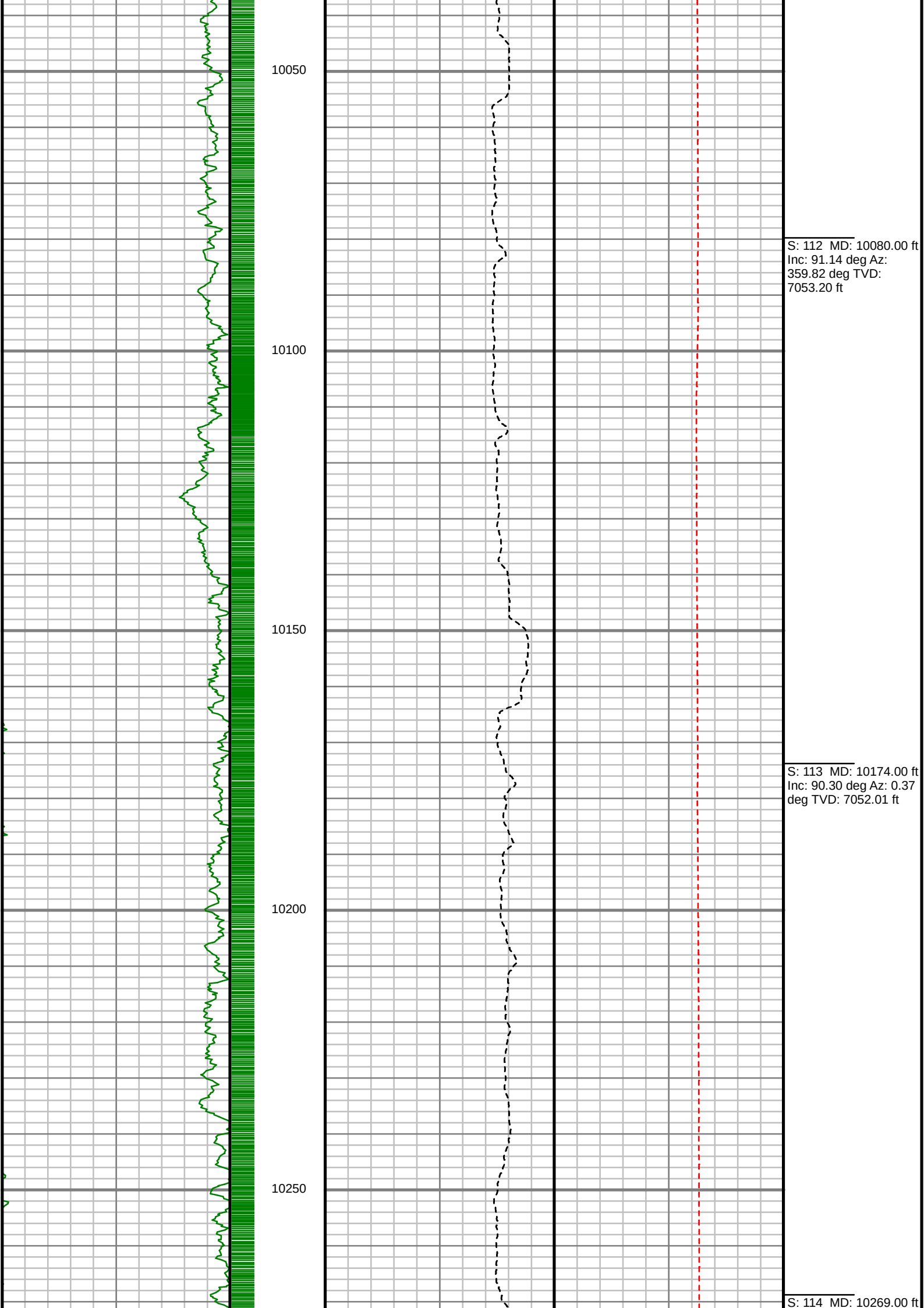

8900
8950
9000
9050
9100
S: 100 MD: 8946.00 ft
Inc: 91.95 deg Az: 0.75
deg TVD: 7064.56 ft
S: 101 MD: 9040.00 ft
Inc: 89.97 deg Az: 0.54
deg TVD: 7062.99 ft

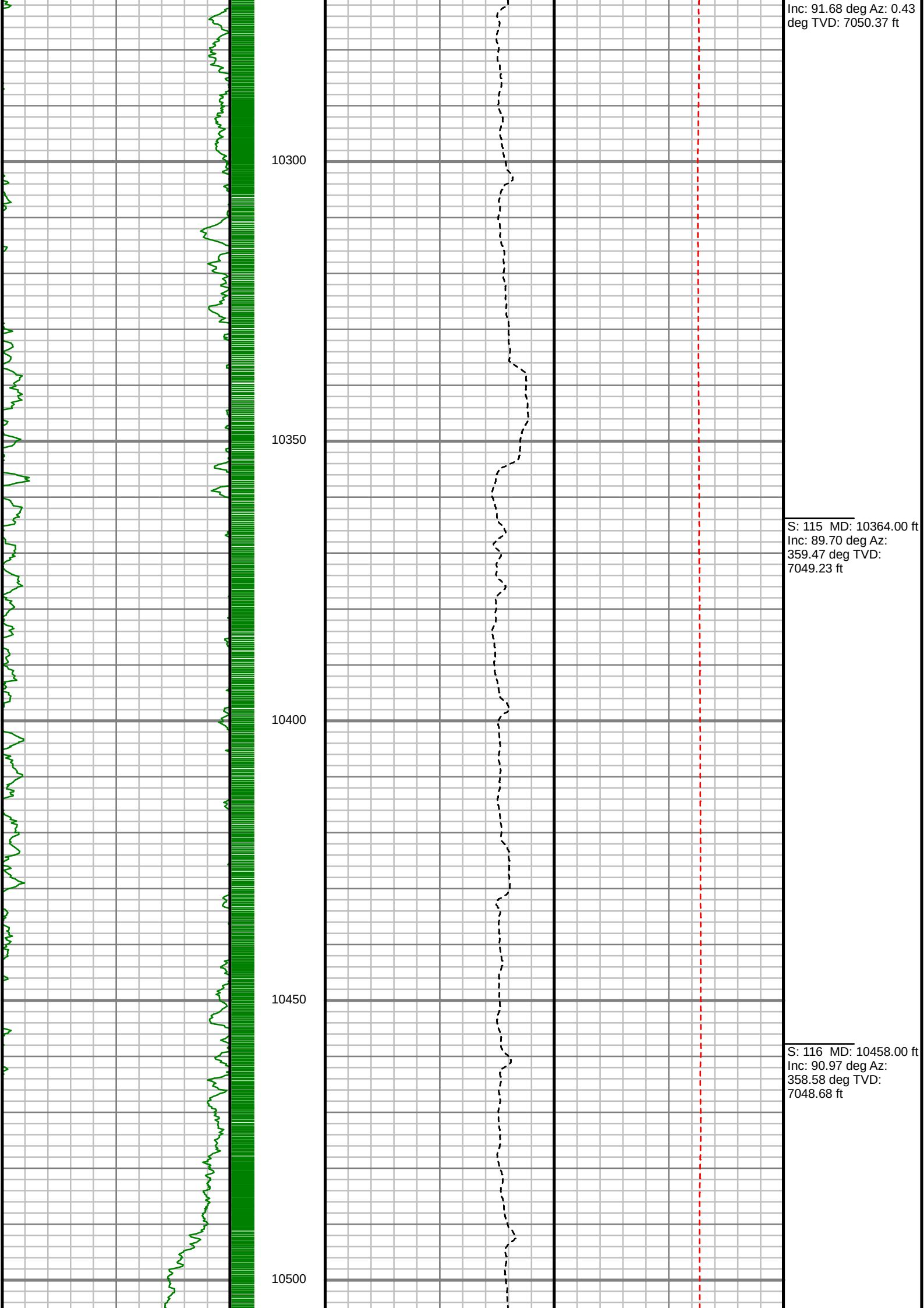

9150
9200
9250
9300
S: 102 MD: 9135.00 ft
Inc: 91.18 deg Az: 0.17
deg TVD: 7062.04 ft
S: 103 MD: 9229.00 ft
Inc: 90.10 deg Az: 1.54
deg TVD: 7061.00 ft
S: 104 MD: 9324.00 ft
Inc: 91.88 deg Az: 1.16
deg TVD: 7059.35 ft

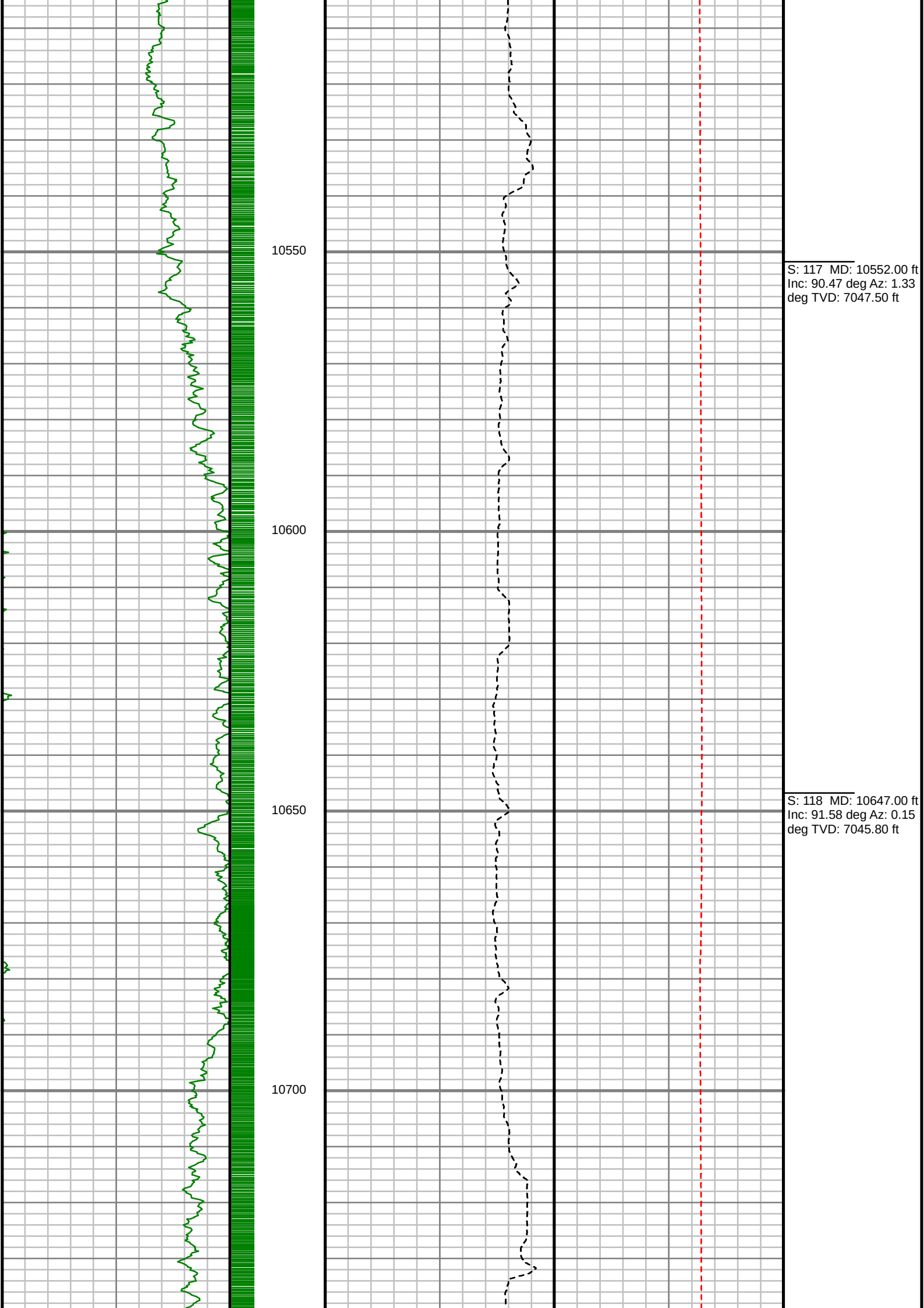

9350
9400
9450
9500
9550
S: 105 MD: 9419.00 ft
Inc: 90.40 deg Az:
358.83 deg TVD:
7057.46 ft
S: 106 MD: 9513.00 ft
Inc: 91.68 deg Az:
359.67 deg TVD:
7055.75 ft

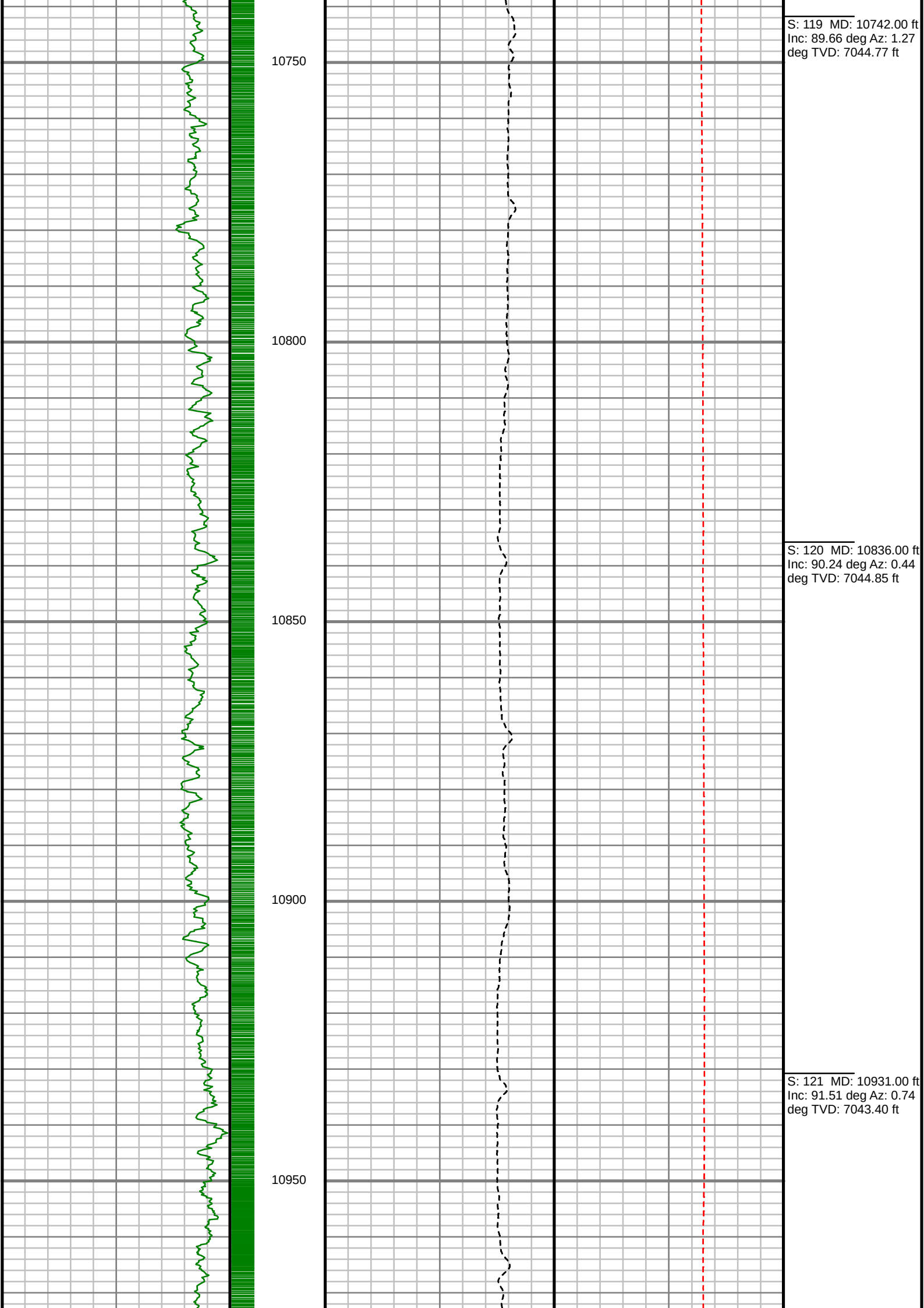

9600
9650
9700
9750
9800
S: 107 MD: 9608.00 ft
Inc: 89.76 deg Az:
358.59 deg TVD:
7054.55 ft
S: 108 MD: 9702.00 ft
Inc: 91.14 deg Az:
358.46 deg TVD:
7053.81 ft
S: 109 MD: 9797.00 ft
Inc: 89.09 deg Az:

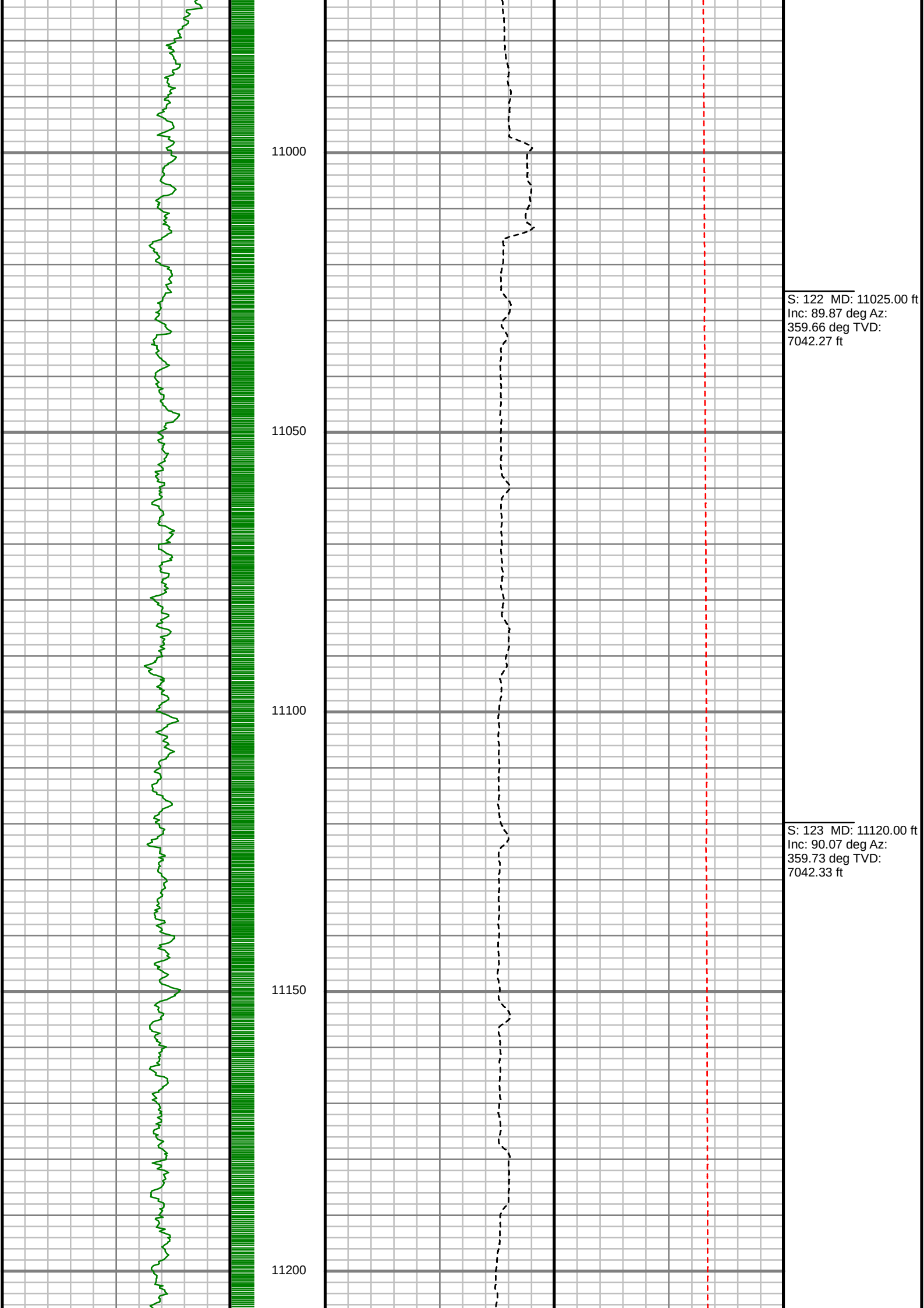

7053.61 ft
9850
S: 110 MD: 9891.00 ft
Inc: 90.57 deg Az:
357.75 deg TVD:
7053.89 ft
9900
9950
S: 111 MD: 9986.00 ft
Inc: 89.56 deg Az: 0.16
deg TVD: 7053.78 ft
10000

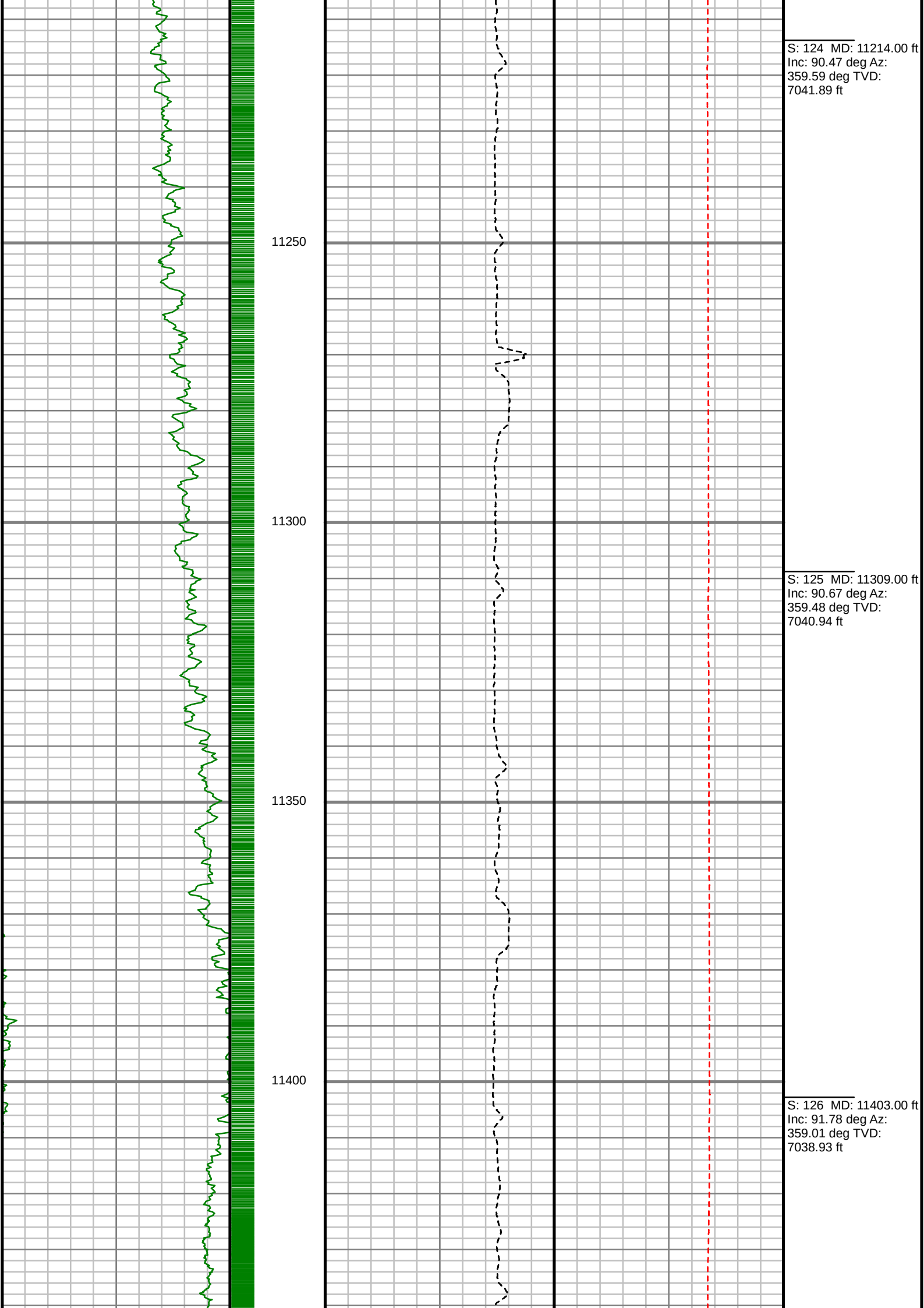

10050
10100
10150
10200
10250
S: 112 MD: 10080.00 ft Inc: 91.14 deg Az: 359.82 deg TVD: 7053.20 ft
S: 113 MD: 10174.00 ft Inc: 90.30 deg Az: 0.37 deg TVD: 7052.01 ft
S: 114 MD: 10269.00 ft

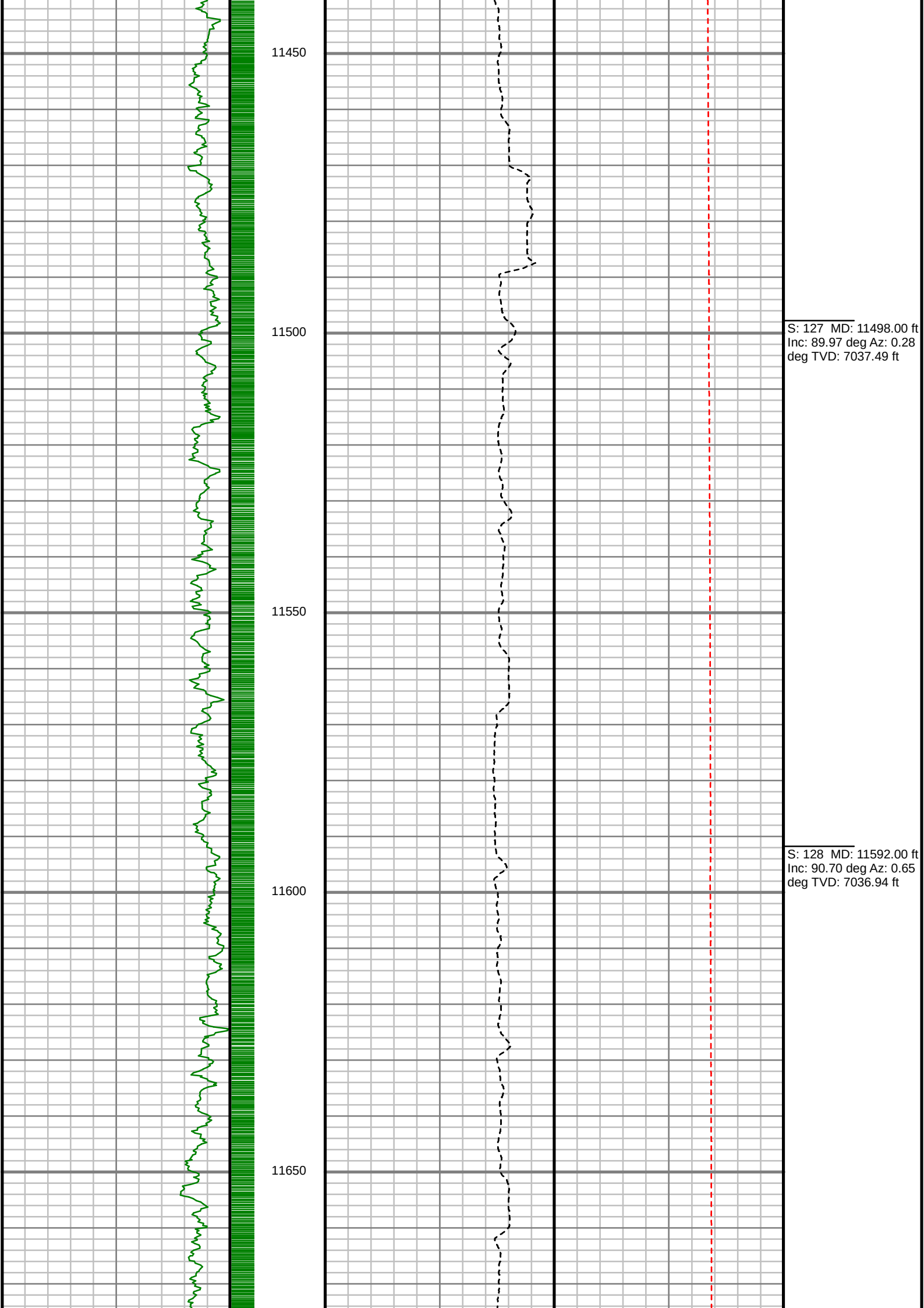

Inc: 91.68 deg Az: 0.43 deg TVD: 7050.37 ft
10300
10350
S: 115 MD: 10364.00 ft Inc: 89.70 deg Az: 359.47 deg TVD: 7049.23 ft
10400
10450
S: 116 MD: 10458.00 ft Inc: 90.97 deg Az: 358.58 deg TVD: 7048.68 ft
10500

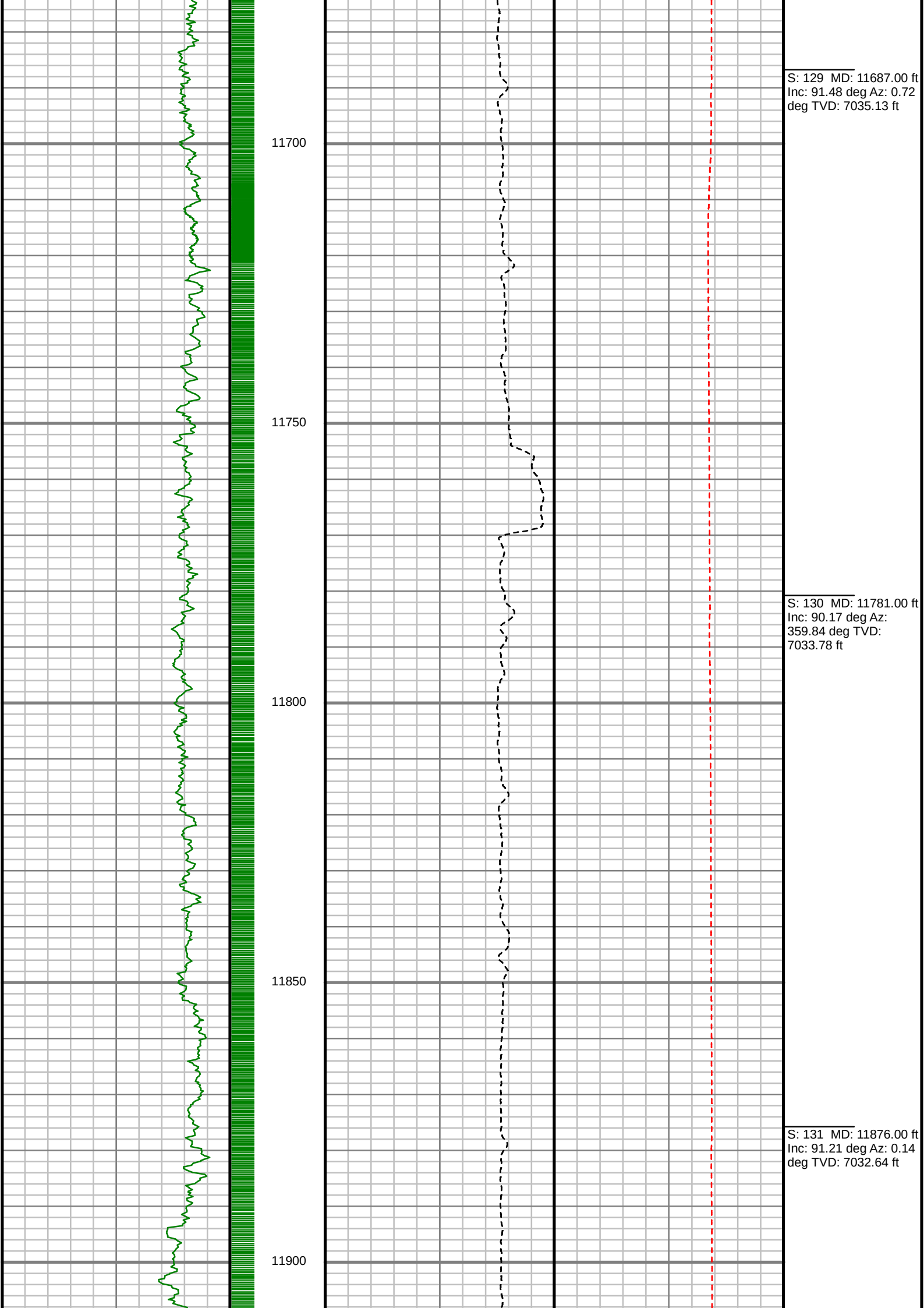

10550
10600
10650
10700
S: 117 MD: 10552.00 ft
Inc: 90.47 deg Az: 1.33
deg TVD: 7047.50 ft
S: 118 MD: 10647.00 ft
Inc: 91.58 deg Az: 0.15
deg TVD: 7045.80 ft

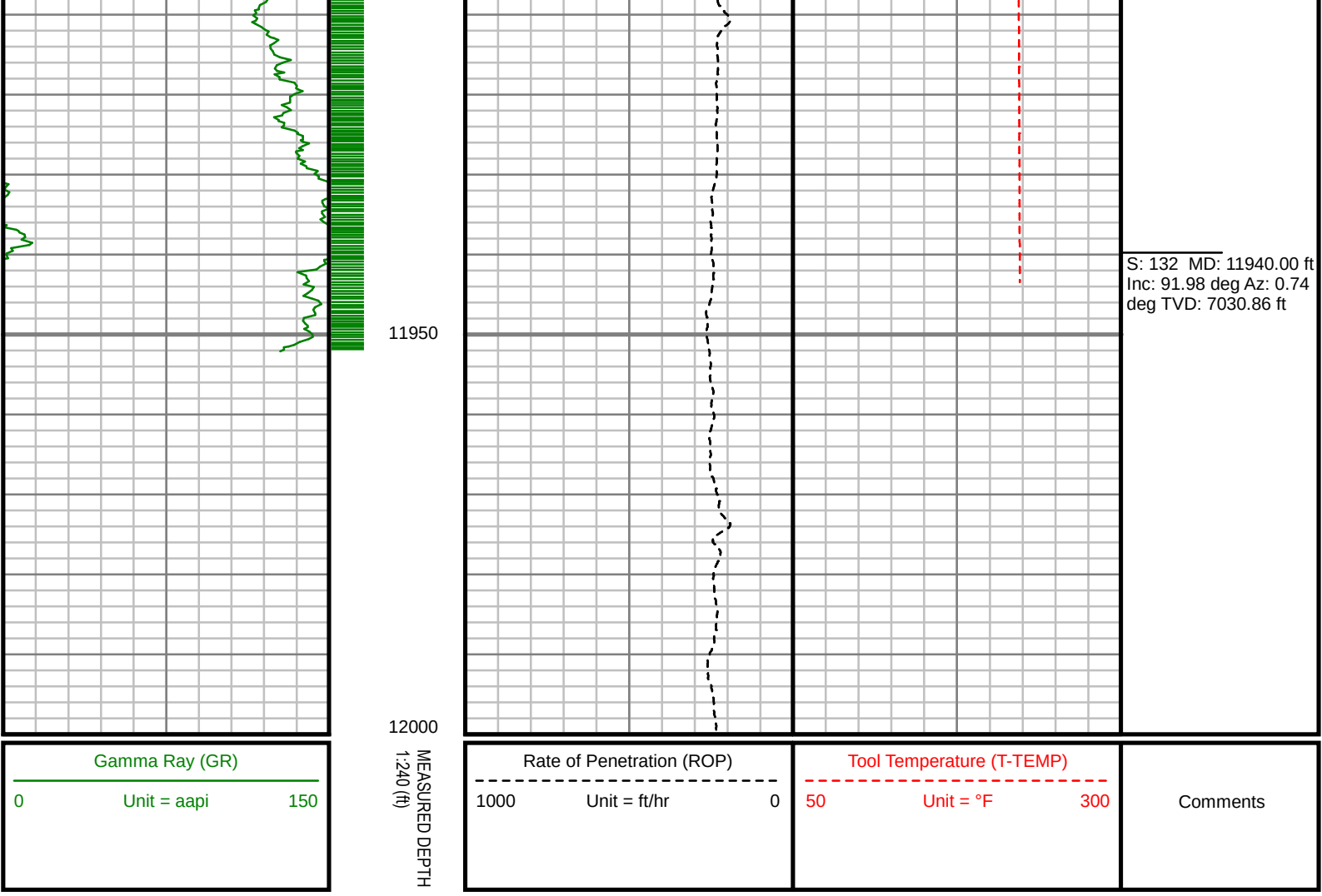

10750
10800
10850
10900
10950
S: 119 MD: 10742.00 ft
Inc: 89.66 deg Az: 1.27
deg TVD: 7044.77 ft
S: 120 MD: 10836.00 ft
Inc: 90.24 deg Az: 0.44
deg TVD: 7044.85 ft
S: 121 MD: 10931.00 ft
Inc: 91.51 deg Az: 0.74
deg TVD: 7043.40 ft


11000
11050
11100
11150
11200
S: 122 MD: 11025.00 ft
Inc: 89.87 deg Az:
359.66 deg TVD:
7042.27 ft
S: 123 MD: 11120.00 ft
Inc: 90.07 deg Az:
359.73 deg TVD:
7042.33 ft


S: 124 MD: 11214.00 ft
Inc: 90.47 deg Az:
359.59 deg TVD:
7041.89 ft
11250
11300
S: 125 MD: 11309.00 ft
Inc: 90.67 deg Az:
359.48 deg TVD:
7040.94 ft
11350
11400
S: 126 MD: 11403.00 ft
Inc: 91.78 deg Az:
359.01 deg TVD:
7038.93 ft


11450
11500
11550
11600
11650
S: 127 MD: 11498.00 ft
Inc: 89.97 deg Az: 0.28
deg TVD: 7037.49 ft
S: 128 MD: 11592.00 ft
Inc: 90.70 deg Az: 0.65
deg TVD: 7036.94 ft


S: 129 MD: 11687.00 ft Inc: 91.48 deg Az: 0.72 deg TVD: 7035.13 ft
11700
11750
S: 130 MD: 11781.00 ft Inc: 90.17 deg Az: 359.84 deg TVD: 7033.78 ft
11800
11850
S: 131 MD: 11876.00 ft Inc: 91.21 deg Az: 0.14 deg TVD: 7032.64 ft
11900


S: 132 MD: 11940.00 ft
Inc: 91.98 deg Az: 0.74
deg TVD: 7030.86 ft
11950
12000
Gamma Ray (GR)
0
Unit = aapi
150
MEASURED DEPTH
1:240 (ft)
Rate of Penetration (ROP)
1000
Unit = ft/hr
0
Tool Temperature (T-TEMP)
50
Unit = °F
300
Comments

Scientific Drilling

MWD Survey Report

Well Location	1N-65W-09 BANE PAD
Well Name	BANE 28N1-9HZ
Survey Date	7/20/2015
Latitude	40°3'37.595"N
Longitude	104°39'55.750"W
Btotal	52566, 52601, 52638 nT
Dip	66.51, 66.52, 66.54 deg
Magnetic Declination	8.09, 8.11, 8.14 deg
North Reference	True North
Grid Correction	None
Depth Reference	RKB (25.00 ft)
Calculation Method	Minimum Curvature
Section (VS) Ref	0.00N (ft), 0.00E (ft), 0.00Azim (deg)
Operator(s)	B. GREER, M. SCHUSTER, S. WAXLER

Well Notes

SURVEYS FROM 0 FT. TO 1616 FT. WERE ACQUIRED BY CATHEDRAL MWD.

SURVEYS FROM 1616 FT. TO 11940 FT. WERE ACQUIRED BY SCIENTIFIC DRILLING INTERNATIONAL MWD.

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid	Invalid
20.00	0.00	0.00	20.00	0.00	0.00	0.00	0.00	20.00
105.00	0.30	41.70	105.00	0.17	0.17	0.15	0.35	85.00
167.00	0.20	63.30	167.00	0.34	0.34	0.35	0.22	62.00
225.00	0.60	55.50	225.00	0.55	0.55	0.69	0.69	58.00
285.00	0.50	49.40	284.99	0.90	0.90	1.15	0.19	60.00
348.00	0.30	192.20	347.99	0.92	0.92	1.32	1.21	63.00
413.00	1.10	233.20	412.99	0.38	0.38	0.79	1.38	65.00
476.00	1.80	244.30	475.97	-0.41	-0.41	-0.59	1.19	63.00
541.00	3.40	242.40	540.90	-1.75	-1.75	-3.21	2.46	65.00
604.00	4.50	239.70	603.75	-3.86	-3.86	-7.00	1.77	63.00
668.00	5.80	238.70	667.49	-6.81	-6.81	-11.94	2.04	64.00
731.00	7.20	237.50	730.08	-10.58	-10.58	-17.99	2.23	63.00
795.00	8.00	237.90	793.52	-15.10	-15.10	-25.14	1.25	64.00
859.00	8.90	236.50	856.82	-20.20	-20.20	-33.04	1.44	64.00
923.00	10.20	233.20	919.94	-26.33	-26.33	-41.71	2.20	64.00
985.00	11.10	232.50	980.87	-33.25	-33.25	-50.84	1.47	62.00
1049.00	11.90	231.70	1043.58	-41.09	-41.09	-60.90	1.27	64.00
1113.00	12.20	232.60	1106.17	-49.29	-49.29	-71.46	0.55	64.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
1177.00	12.60	233.50	1168.68	-57.55	-57.55	-82.44	0.69	64.00
1241.00	13.20	233.70	1231.06	-66.03	-66.03	-93.94	0.94	64.00
1303.00	14.00	232.90	1291.33	-74.74	-74.74	-105.63	1.33	62.00
1368.00	14.80	232.30	1354.28	-84.56	-84.56	-118.47	1.25	65.00
1432.00	16.00	229.70	1415.98	-95.27	-95.27	-131.66	2.16	64.00
1495.00	17.60	229.20	1476.29	-107.11	-107.11	-145.49	2.55	63.00
1559.00	18.50	229.70	1537.14	-120.00	-120.00	-160.56	1.43	64.00
1571.00	18.70	229.20	1548.52	-122.48	-122.48	-163.47	2.13	12.00
1858.00	17.70	232.39	1821.16	-179.17	-179.17	-232.86	0.49	287.00
2047.00	18.78	237.68	2000.68	-212.97	-212.97	-281.33	1.05	189.00
2141.00	19.05	235.65	2089.60	-229.72	-229.72	-306.78	0.76	94.00
2236.00	18.27	234.00	2179.61	-247.22	-247.22	-331.63	0.99	95.00
2330.00	19.23	235.24	2268.62	-264.71	-264.71	-356.27	1.11	94.00
2425.00	19.58	230.49	2358.23	-283.76	-283.76	-381.40	1.70	95.00
2519.00	17.62	231.34	2447.32	-302.67	-302.67	-404.66	2.10	94.00
2614.00	17.97	229.61	2537.77	-321.15	-321.15	-427.05	0.67	95.00
2709.00	19.66	229.60	2627.69	-341.01	-341.01	-450.39	1.78	95.00
2803.00	18.37	225.22	2716.56	-361.69	-361.69	-472.94	2.05	94.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
2898.00	18.37	229.93	2806.73	-381.87	-381.87	-495.02	1.56	95.00
2992.00	19.32	229.45	2895.69	-401.52	-401.52	-518.17	1.02	94.00
3087.00	19.69	226.59	2985.24	-422.73	-422.73	-541.73	1.07	95.00
3181.00	20.67	228.04	3073.47	-444.70	-444.70	-565.57	1.17	94.00
3276.00	19.60	227.04	3162.67	-466.77	-466.77	-589.70	1.18	95.00
3370.00	19.82	228.84	3251.16	-488.00	-488.00	-613.23	0.69	94.00
3465.00	19.07	230.52	3340.75	-508.47	-508.47	-637.33	0.99	95.00
3559.00	18.21	230.28	3429.81	-527.62	-527.62	-660.48	0.91	94.00
3654.00	18.28	226.96	3520.04	-547.28	-547.28	-682.79	1.10	95.00
3748.00	17.26	227.26	3609.55	-566.80	-566.80	-703.81	1.09	94.00
3843.00	18.04	226.43	3700.08	-586.50	-586.50	-724.81	0.86	95.00
3937.00	17.05	223.56	3789.71	-606.52	-606.52	-744.85	1.40	94.00
4032.00	16.76	227.15	3880.61	-625.93	-625.93	-764.49	1.14	95.00
4126.00	16.84	227.07	3970.60	-644.42	-644.42	-784.40	0.09	94.00
4221.00	17.26	233.21	4061.43	-662.23	-662.23	-805.76	1.94	95.00
4315.00	17.91	235.65	4151.04	-678.74	-678.74	-828.86	1.05	94.00
4410.00	18.91	234.94	4241.17	-695.82	-695.82	-853.52	1.08	95.00
4504.00	17.75	234.55	4330.40	-712.88	-712.88	-877.67	1.24	94.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
4599.00	15.55	235.14	4421.41	-728.57	-728.57	-899.92	2.32	95.00
4693.00	13.14	240.83	4512.48	-740.98	-740.98	-919.58	2.97	94.00
4788.00	13.00	237.61	4605.02	-751.96	-751.96	-938.03	0.78	95.00
4882.00	11.82	233.73	4696.83	-763.32	-763.32	-954.72	1.53	94.00
4977.00	11.42	222.43	4789.89	-776.02	-776.02	-968.92	2.43	95.00
5071.00	8.26	220.12	4882.49	-788.06	-788.06	-979.56	3.39	94.00
5165.00	5.88	213.76	4975.77	-797.24	-797.24	-986.59	2.66	94.00
5260.00	4.03	192.19	5070.42	-804.55	-804.55	-990.00	2.73	95.00
5354.00	2.36	167.19	5164.28	-809.67	-809.67	-990.27	2.28	94.00
5449.00	2.07	129.88	5259.21	-812.68	-812.68	-988.52	1.52	95.00
5543.00	1.58	132.66	5353.16	-814.65	-814.65	-986.26	0.53	94.00
5638.00	1.41	110.95	5448.13	-815.96	-815.96	-984.20	0.62	95.00
5732.00	1.08	116.86	5542.11	-816.77	-816.77	-982.33	0.38	94.00
5827.00	1.88	97.86	5637.08	-817.39	-817.39	-979.99	0.98	95.00
5921.00	1.76	91.60	5731.03	-817.64	-817.64	-977.02	0.25	94.00
6016.00	1.84	88.72	5825.98	-817.65	-817.65	-974.03	0.13	95.00
6110.00	0.83	73.33	5919.96	-817.42	-817.42	-971.87	1.14	94.00
6205.00	1.65	106.55	6014.93	-817.61	-817.61	-969.90	1.12	95.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
6299.00	0.90	86.81	6108.91	-817.96	-817.96	-967.86	0.92	94.00
6394.00	0.87	85.17	6203.90	-817.86	-817.86	-966.40	0.04	95.00
6488.00	0.84	122.85	6297.89	-818.17	-818.17	-965.10	0.59	94.00
6583.00	0.42	148.40	6392.88	-818.85	-818.85	-964.33	0.53	95.00
6677.00	9.48	17.65	6486.47	-811.75	-811.75	-961.80	10.38	94.00
6771.00	16.97	17.21	6577.91	-791.24	-791.24	-955.38	7.96	94.00
6866.00	25.05	14.85	6666.52	-758.50	-758.50	-946.11	8.56	95.00
6960.00	32.18	1.19	6749.08	-714.14	-714.14	-940.47	10.25	94.00
7055.00	37.59	1.96	6826.98	-659.85	-659.85	-938.96	5.72	95.00
7149.00	44.01	2.18	6898.10	-598.50	-598.50	-936.73	6.83	94.00
7244.00	53.31	1.03	6960.78	-527.28	-527.28	-934.79	9.84	95.00
7433.00	72.54	0.53	7046.39	-359.79	-359.79	-932.59	10.18	189.00
7527.00	79.27	359.24	7069.26	-268.67	-268.67	-932.79	7.28	94.00
7622.00	87.72	358.71	7080.02	-174.38	-174.38	-934.48	8.91	95.00
7717.00	89.36	358.55	7082.44	-79.45	-79.45	-936.75	1.74	95.00
7811.00	90.47	358.62	7082.58	14.52	14.52	-939.06	1.18	94.00
7906.00	90.03	0.72	7082.17	109.52	109.52	-939.61	2.25	95.00
8000.00	90.54	1.29	7081.70	203.50	203.50	-937.97	0.81	94.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
8094.00	91.24	0.52	7080.24	297.48	297.48	-936.49	1.11	94.00
8189.00	90.40	359.40	7078.87	392.46	392.46	-936.55	1.47	95.00
8283.00	91.41	359.03	7077.39	486.44	486.44	-937.84	1.14	94.00
8378.00	90.84	359.29	7075.52	581.41	581.41	-939.23	0.66	95.00
8473.00	91.54	358.48	7073.55	676.37	676.37	-941.08	1.13	95.00
8567.00	90.17	359.54	7072.14	770.34	770.34	-942.70	1.85	94.00
8662.00	90.91	359.23	7071.25	865.33	865.33	-943.72	0.84	95.00
8756.00	92.22	359.84	7068.69	959.29	959.29	-944.48	1.54	94.00
8851.00	90.40	0.38	7066.51	1054.26	1054.26	-944.29	1.99	95.00
8946.00	91.95	0.75	7064.56	1149.24	1149.24	-943.36	1.67	95.00
9040.00	89.97	0.54	7062.99	1243.21	1243.21	-942.31	2.12	94.00
9135.00	91.18	0.17	7062.04	1338.20	1338.20	-941.72	1.33	95.00
9229.00	90.10	1.54	7061.00	1432.18	1432.18	-940.32	1.85	94.00
9324.00	91.88	1.16	7059.35	1527.14	1527.14	-938.08	1.92	95.00
9419.00	90.40	358.83	7057.46	1622.11	1622.11	-938.09	2.90	95.00
9513.00	91.68	359.67	7055.75	1716.09	1716.09	-939.32	1.63	94.00
9608.00	89.76	358.59	7054.55	1811.06	1811.06	-940.77	2.32	95.00
9702.00	91.14	358.46	7053.81	1905.02	1905.02	-943.19	1.47	94.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
9797.00	89.09	358.16	7053.61	1999.98	1999.98	-945.99	2.18	95.00
9891.00	90.57	357.75	7053.89	2093.91	2093.91	-949.35	1.63	94.00
9986.00	89.56	0.16	7053.78	2188.89	2188.89	-951.07	2.75	95.00
10080.00	91.14	359.82	7053.20	2282.89	2282.89	-951.09	1.72	94.00
10174.00	90.30	0.37	7052.01	2376.88	2376.88	-950.94	1.07	94.00
10269.00	91.68	0.43	7050.37	2471.86	2471.86	-950.28	1.45	95.00
10364.00	89.70	359.47	7049.23	2566.85	2566.85	-950.36	2.32	95.00
10458.00	90.97	358.58	7048.68	2660.83	2660.83	-951.95	1.65	94.00
10552.00	90.47	1.33	7047.50	2754.81	2754.81	-952.03	2.97	94.00
10647.00	91.58	0.15	7045.80	2849.78	2849.78	-950.80	1.70	95.00
10742.00	89.66	1.27	7044.77	2944.77	2944.77	-949.62	2.34	95.00
10836.00	90.24	0.44	7044.85	3038.75	3038.75	-948.22	1.08	94.00
10931.00	91.51	0.74	7043.40	3133.74	3133.74	-947.25	1.38	95.00
11025.00	89.87	359.66	7042.27	3227.72	3227.72	-946.92	2.10	94.00
11120.00	90.07	359.73	7042.33	3322.72	3322.72	-947.43	0.22	95.00
11214.00	90.47	359.59	7041.89	3416.72	3416.72	-947.99	0.45	94.00
11309.00	90.67	359.48	7040.94	3511.71	3511.71	-948.76	0.24	95.00
11403.00	91.78	359.01	7038.93	3605.68	3605.68	-949.99	1.28	94.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft
11498.00	89.97	0.28	7037.49	3700.66	3700.66	-950.58	2.33	95.00
11592.00	90.70	0.65	7036.94	3794.66	3794.66	-949.81	0.88	94.00
11687.00	91.48	0.72	7035.13	3889.63	3889.63	-948.68	0.82	95.00
11781.00	90.17	359.84	7033.78	3983.62	3983.62	-948.22	1.68	94.00
11876.00	91.21	0.14	7032.64	4078.61	4078.61	-948.23	1.14	95.00
11940.00	91.98	0.74	7030.86	4142.58	4142.58	-947.74	1.53	64.00

MD	Inc	Azim	TVD	VS	+N/-S	+E/-W	DLS	Course Length
ft	deg	deg	ft	ft	ft	ft	°/100ft	ft

GAMMA RAY

Scientific Drilling

5" = 100' FEET MD