



5" = 100' FEET MD

COMPANY : ANADARKO E&P ONSHORE LLC.
WELL : LAND FED 3N-32HZ
FIELD : WATTENBERG
COUNTY : WELD
STATE : COLORADO
COUNTRY : U.S.A.
UWI : 05123423900000

COMPANY : ANADARKO E&P ONSHORE LLC.

WELL : LAND FED 3N-32HZ

FIELD : WATTENBERG

COUNTY : WELD

STATE : COLORADO

COUNTRY : U.S.A.

UWI : 05123423900000

WELL LOCATION

LAT:40°5'56.494"N LONG:104°48'19.292"W
N:14562852.70 ft E:1694847.26 ft

SEC:32

TWP: 2N

RANGE: 66W

OTHER SERVICES

DIRECTIONAL
ROP

DEPTH REF. : RKB

REF. HEIGHT : 20.000 ft

RKB to Ground Level

GROUND LEVEL : 4899.000 ft

G.L. to MEAN SEA LEVEL

BOREHOLE RECORD

DEVIATION RECORD

HOLE SIZE in	FROM ft	TO ft	INCLINATION deg	FROM ft	TO ft
13.5	0	1882	0 - 17	0	1153
7.875	1882	13035	17 - 17	1153	5449
			17 - 0	5449	6765
			0 - 91	6765	7805
			91 - 93	7805	13035

CASING RECORD

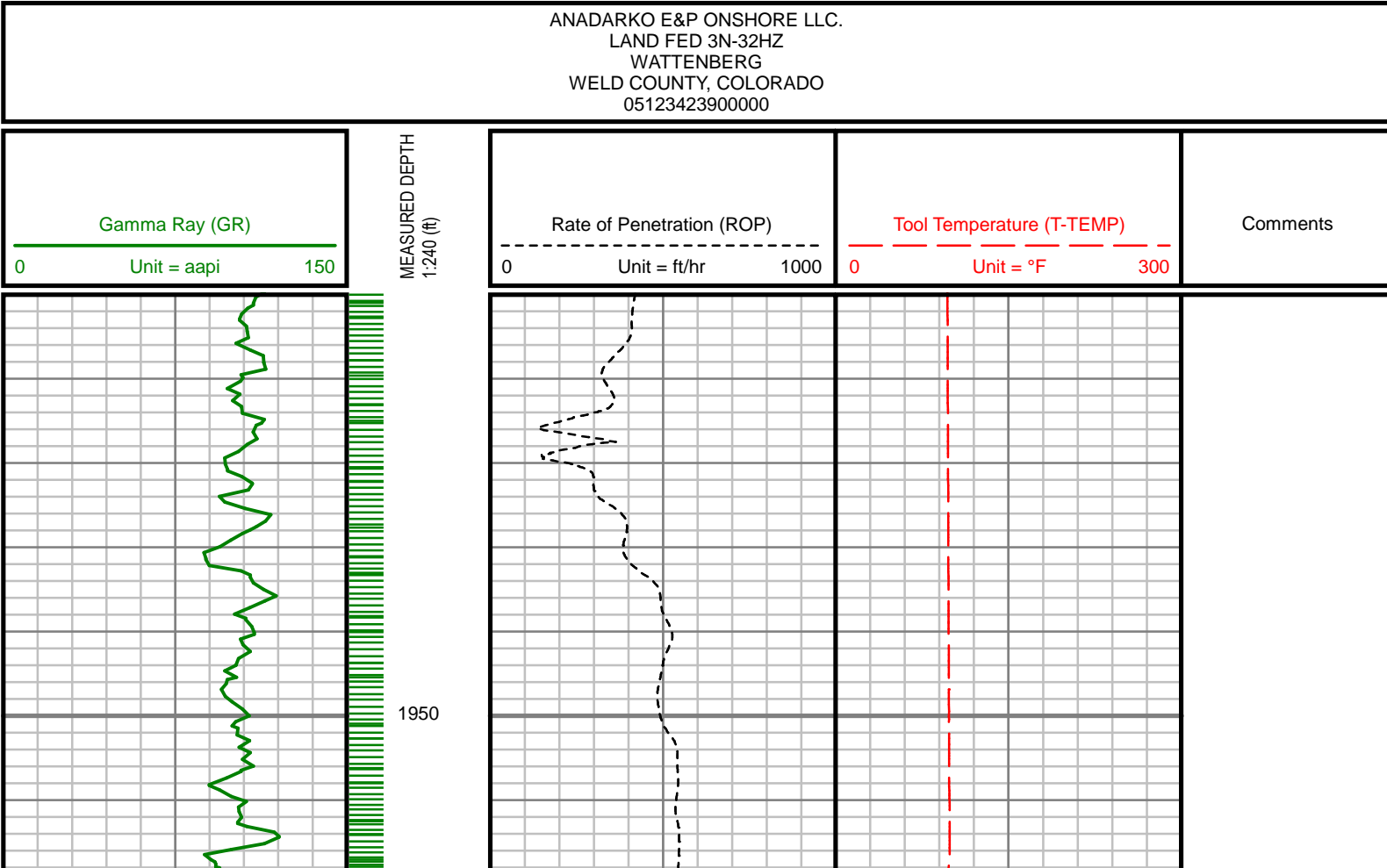
CASING SIZE in	FROM ft	TO ft			
9.625	0	1870			
			DRILLING CO. : PRECISION DRILLING		
			RIG : 461		
			LWD UNIT NO. : DISTRICT : CASPER		
			SPUD DATE : 05/20/2016		
			LWD START DATE : 07/01/2016 DEPTH : 1900 ft		
			LWD END DATE : 07/04/2016 DEPTH : 13035 ft		
			TOTAL DEPTH : 13035 ft		

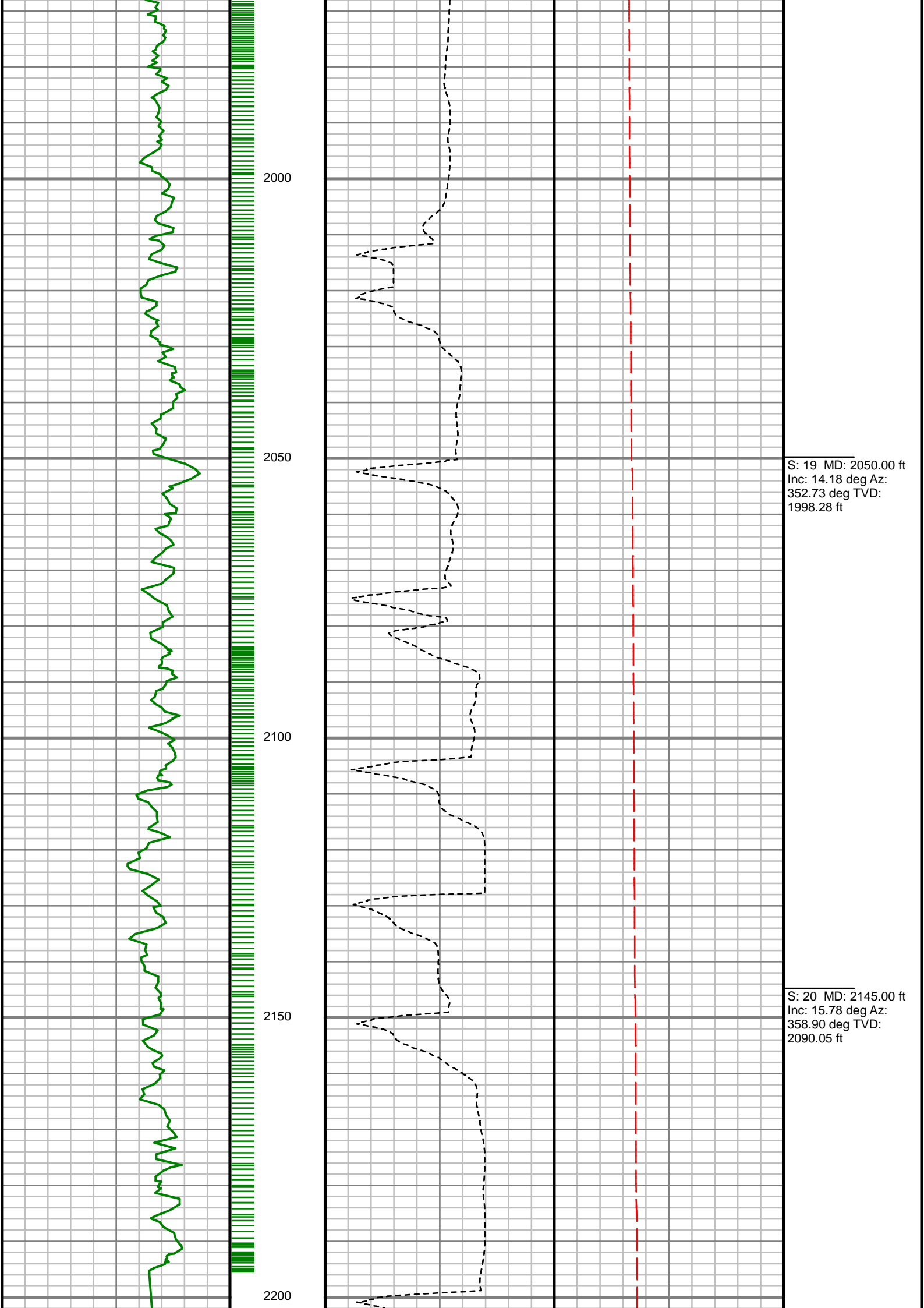
Run Data

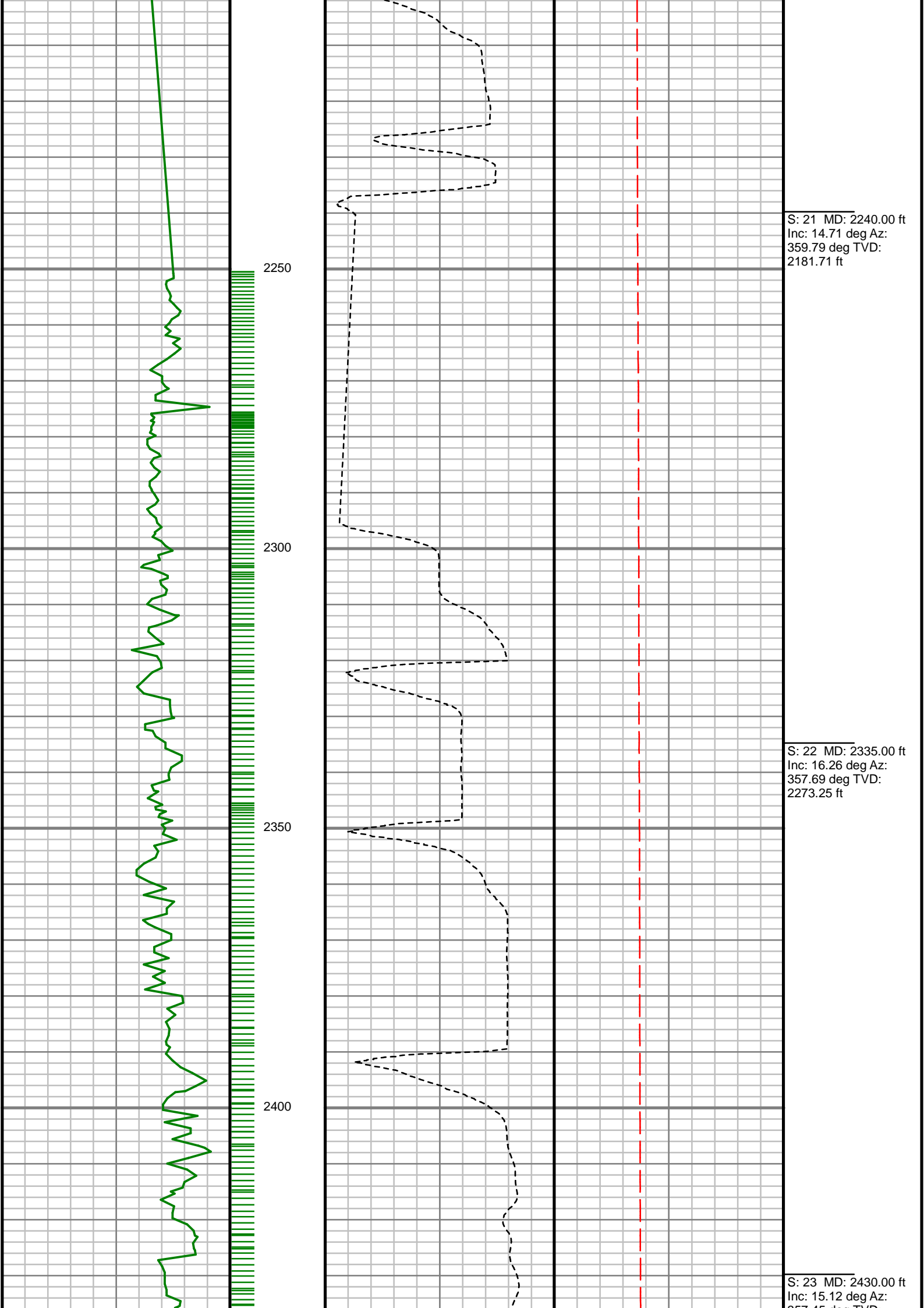
Run Data						
RUN NUMBER	1	2				
START DATE	06/30/2016	07/02/2016				
START TIME	2220	2145				
END DATE	07/02/2016	07/04/2016				
END TIME	2115	2130				
DEPTH IN (ft)	1882	8256				
DEPTH OUT (ft)	8256	13035				
LOG TOP (ft)	1900	8211				
LOG BOTTOM (ft)	8211	13035				
HOLE SIZE (in)	7.875	7.875				
MUD DATA @ (ft)	8256	11070				
MUD TYPE	OIL-BASED	OIL-BASED				
DENSITY (lb / gal)	9.4	9.7				
VISCOSITY (s / qt)	65	61				
pH	4.1	5.0				
FLUID LOSS (cm ³ / 30)	-	-				
SALINITY (ppm)	40000	40000				
Rm (ohmm @ deg F)	-	-				
Rmf (ohmm @ deg F)	-	-				
MAX TEMP (deg F)	200	243				
Rm @ MAX TEMP (ohmm)	-	-				
LWD ENGINEER #1	M. SMITH	M. SMITH				
LWD ENGINEER #2	Z. BROWN	Z. BROWN				
LWD ENGINEER #3	-	-				
LOG WITNESS #1	-	-				
LOG WITNESS #2	-	-				

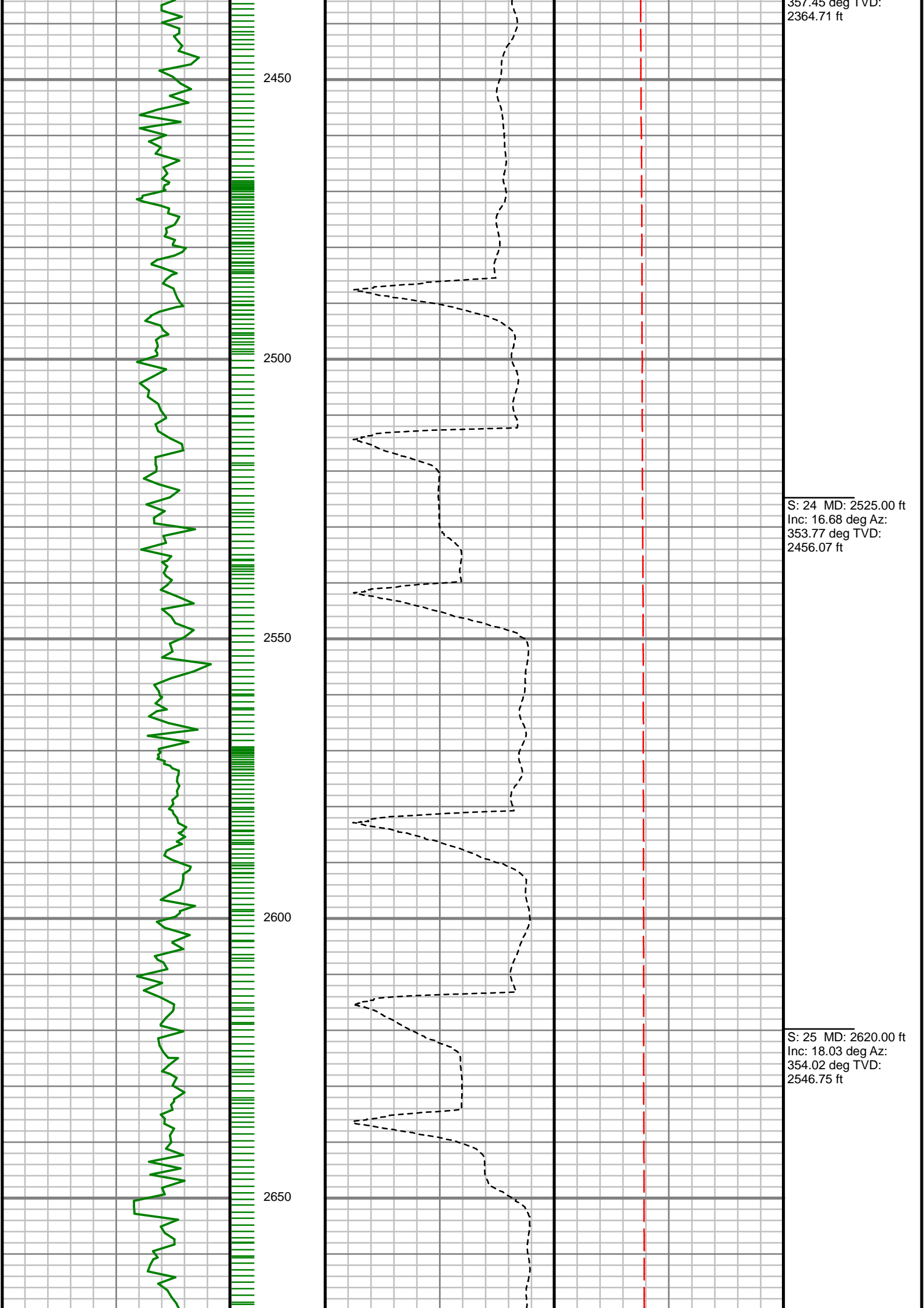
Remarks
ANADARKO E&P ONSHORE LLC. PRODUCTION AFE# 2122897
SCIENTIFIC DRILLING INTERNATIONAL JOB# 370080
ALL REFERENCES IN THE DEPTH TRACK ARE AT BIT DEPTH.
ALL DATA IS MEMORY DATA UNLESS STATED OTHERWISE.
FLAT AVERAGE FILTER OF 1.00 FT APPLIED TO GAMMA RAY CURVE
FLAT AVERAGE FILTER OF 1.00 FT APPLIED 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 = 128-294 / CONT = 715 / MWD EYE = 0645 / GAMMA RAY = 1106
BIT TO SENSOR OFFSETS: SURVEY = 53.34 FT. / GAMMA RAY = 44.65 FT.
RUN #2: MWD / GAMMA RAY LOGGING RUN
SENSORS S/N: PULSER = 128-294 / CONT = 715 / MWD EYE = 0645 / GAMMA RAY = 1106
BIT TO SENSOR OFFSETS: SURVEY = 53.15 FT. / GAMMA RAY = 44.46 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.





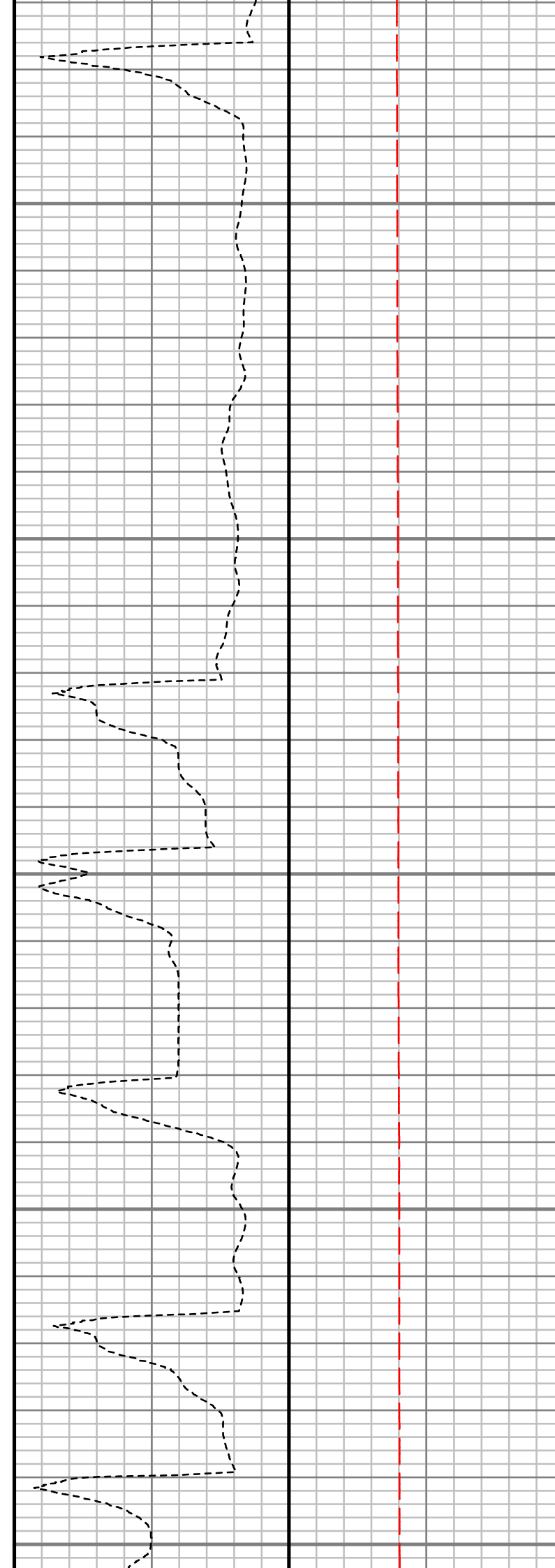
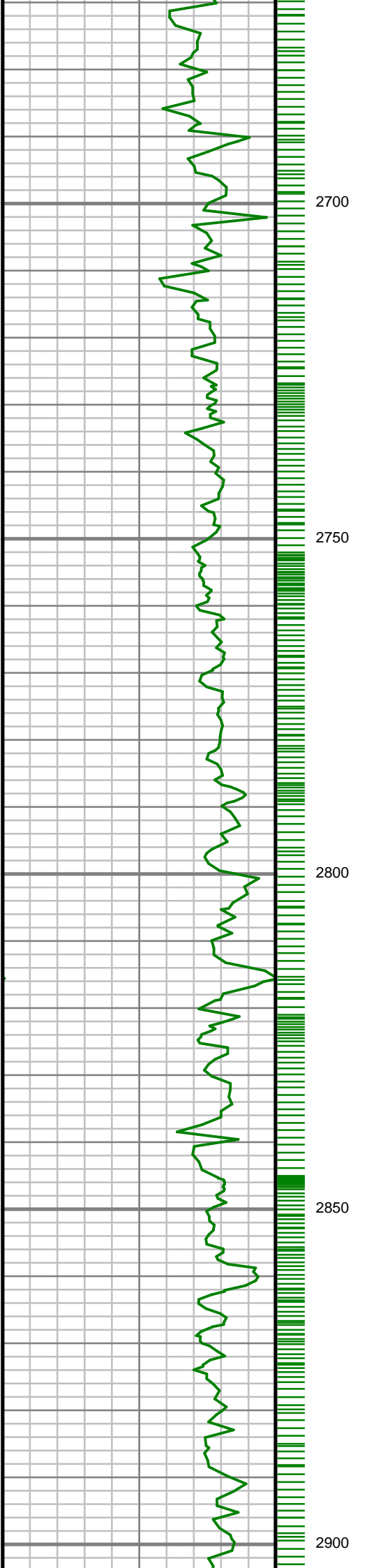




357.45 deg TVD:
2364.71 ft

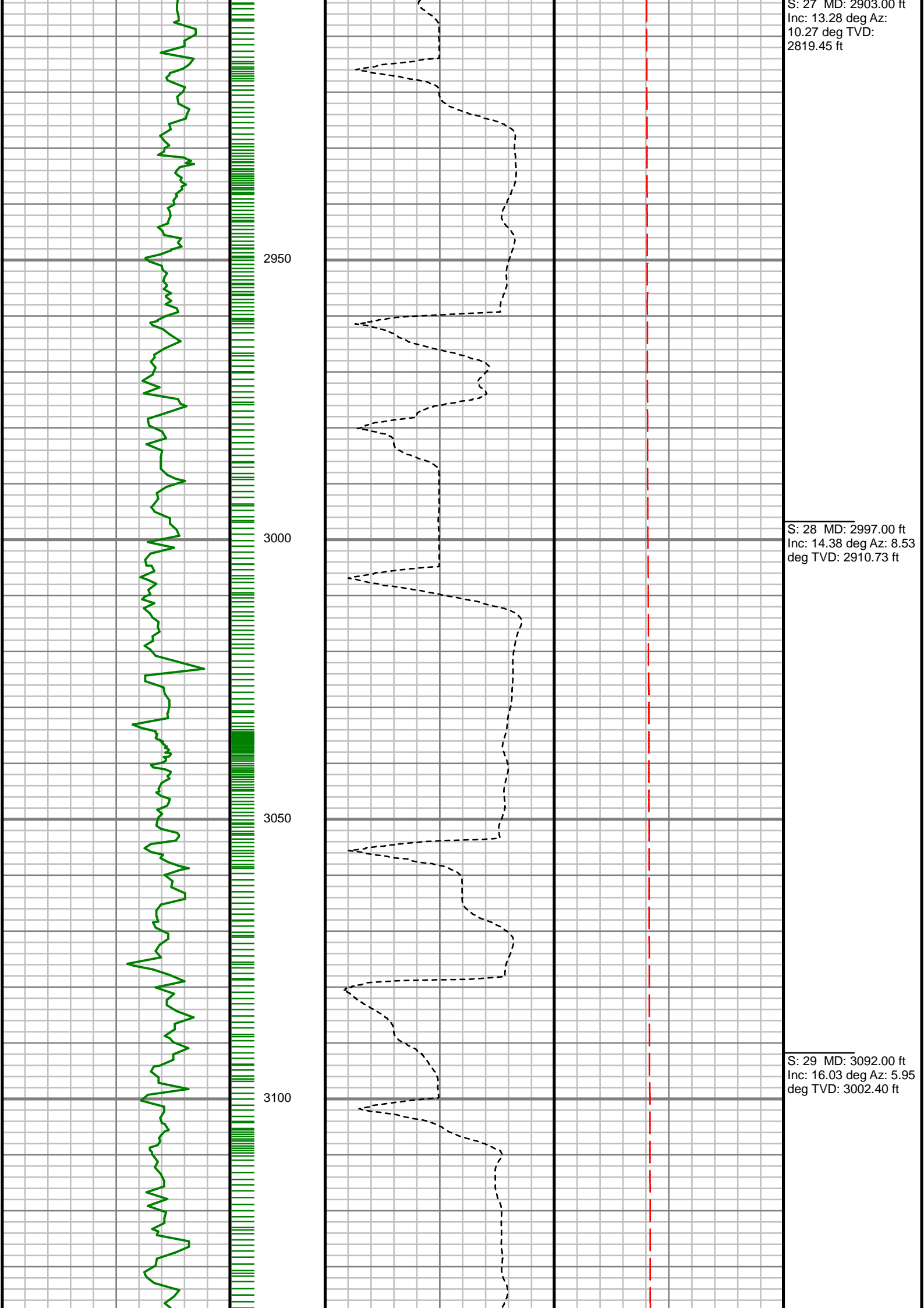
S: 24 MD: 2525.00 ft
Inc: 16.68 deg Az:
353.77 deg TVD:
2456.07 ft

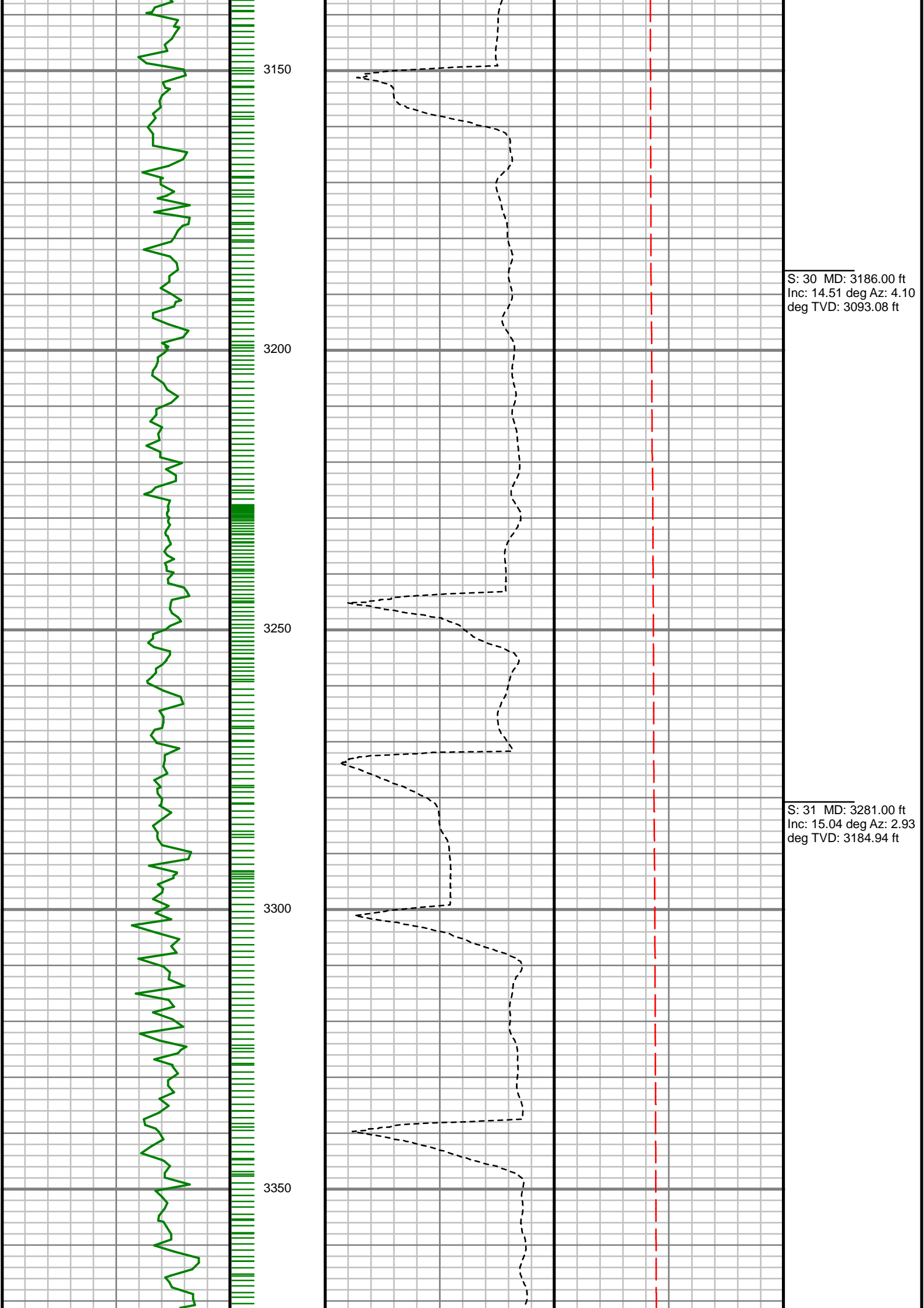
S: 25 MD: 2620.00 ft
Inc: 18.03 deg Az:
354.02 deg TVD:
2546.75 ft

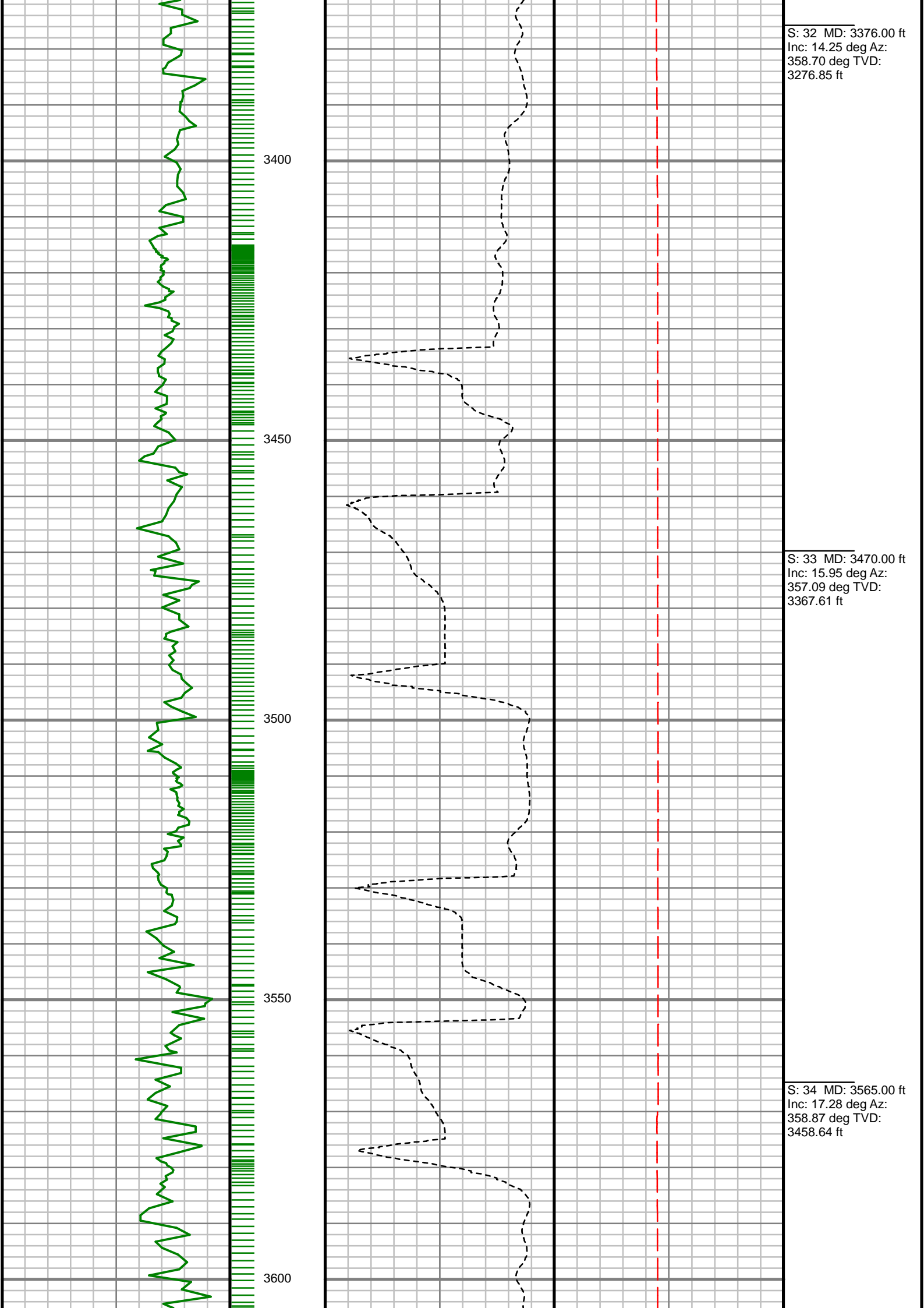


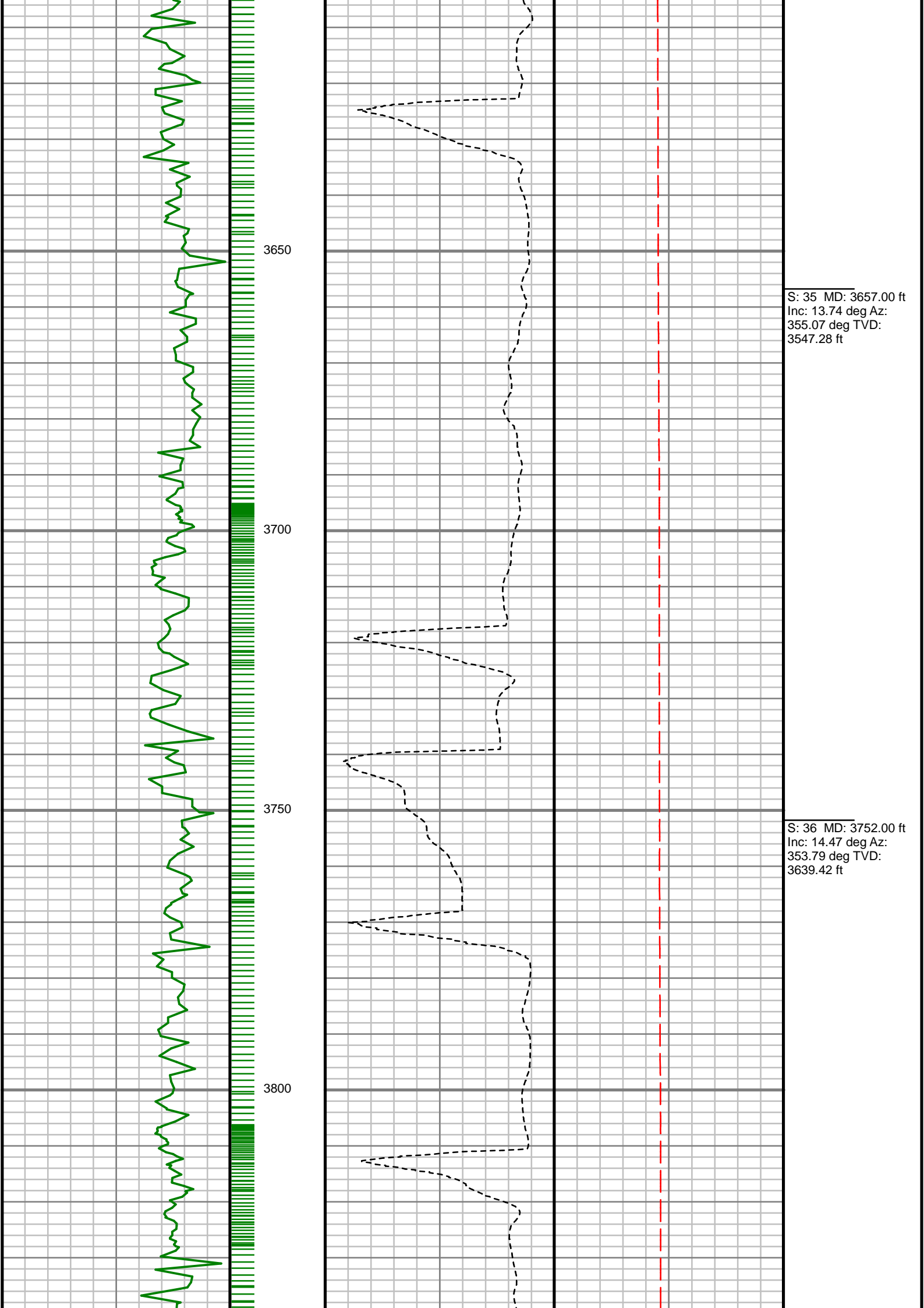
S: 26 MD: 2714.00 ft
Inc: 16.16 deg Az:
353.26 deg TVD:
2636.59 ft

S: 26 MD: 2714.00 ft



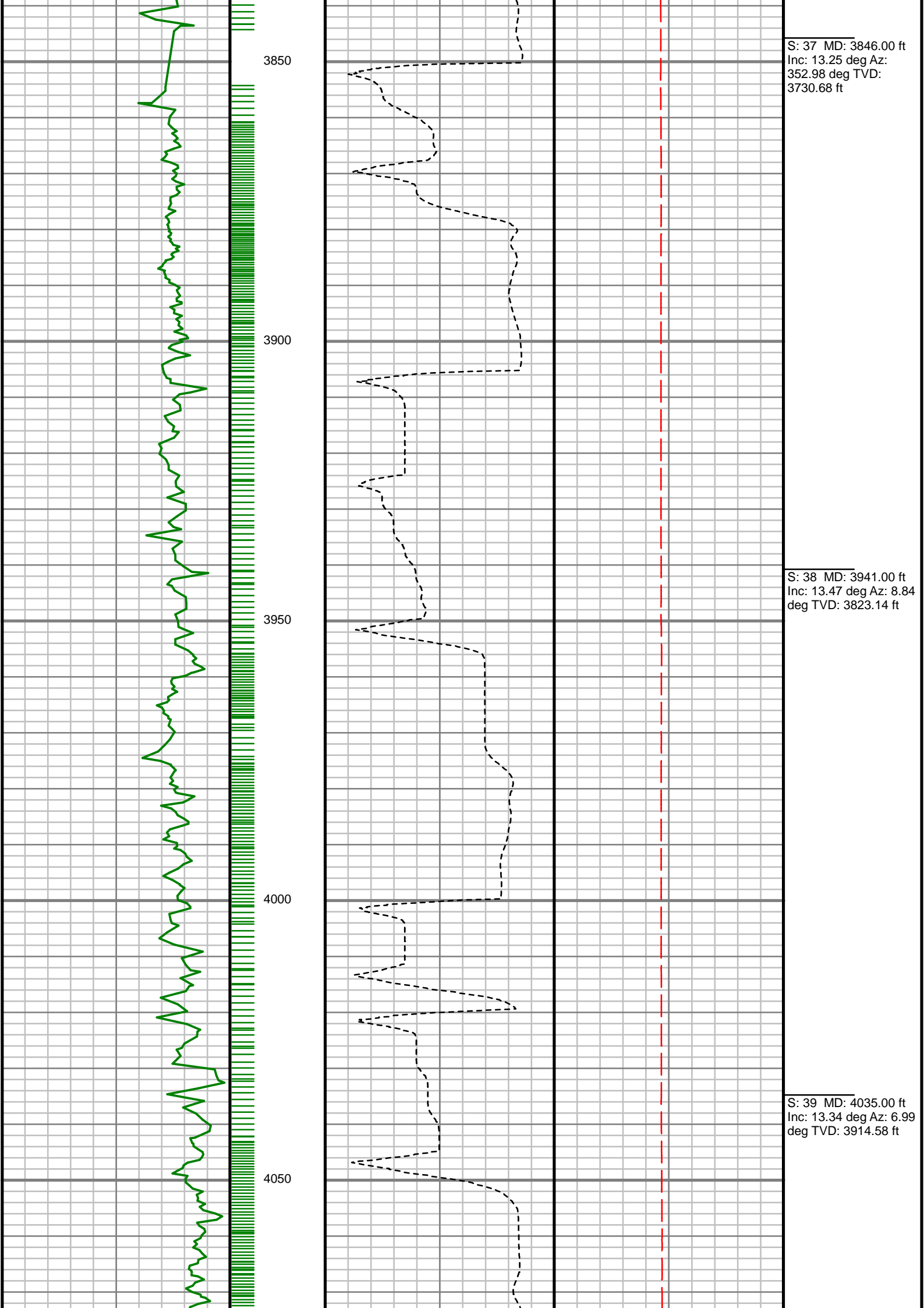


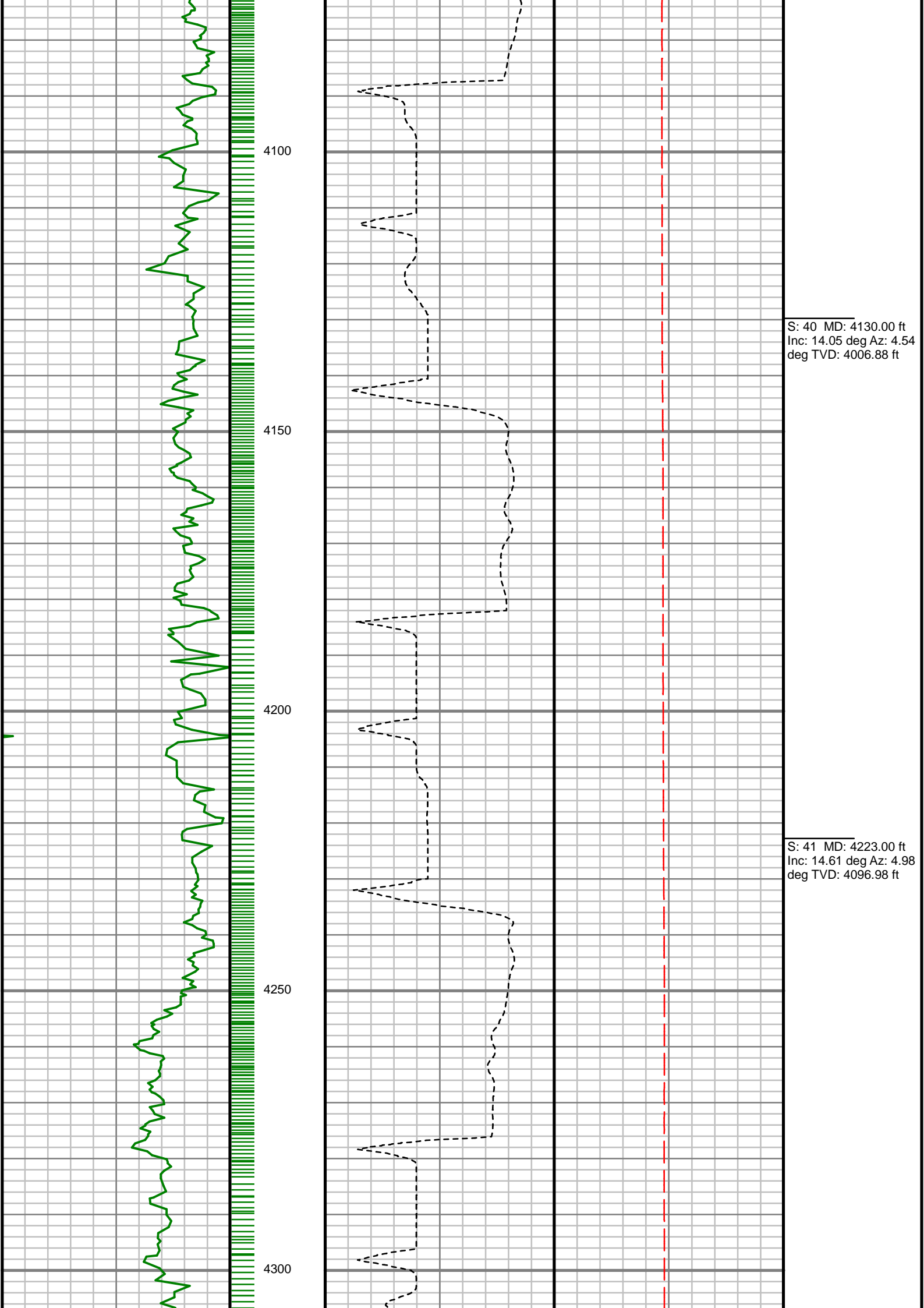


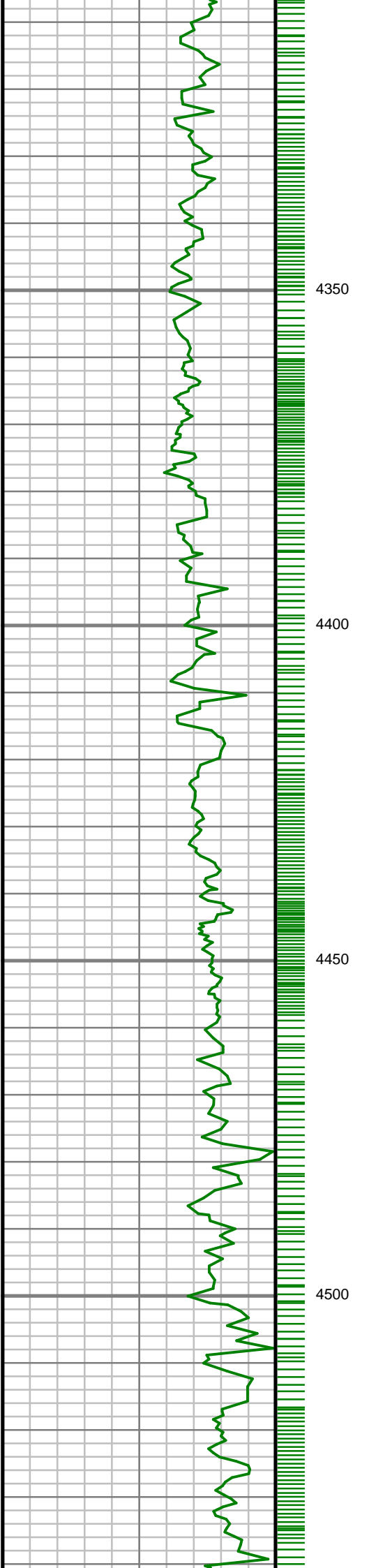


S: 35 MD: 3657.00 ft
Inc: 13.74 deg Az:
355.07 deg TVD:
3547.28 ft

S: 36 MD: 3752.00 ft
Inc: 14.47 deg Az:
353.79 deg TVD:
3639.42 ft



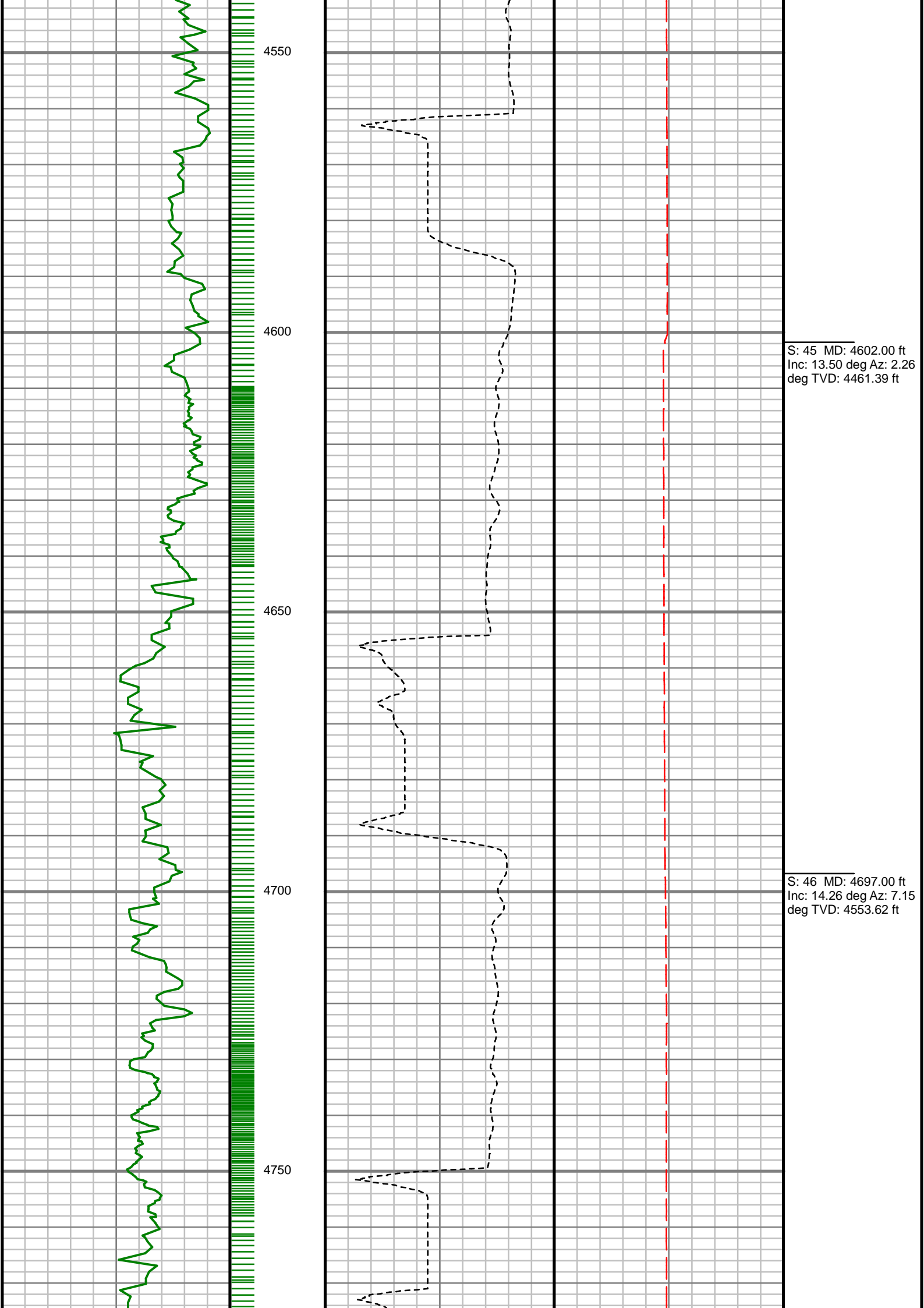


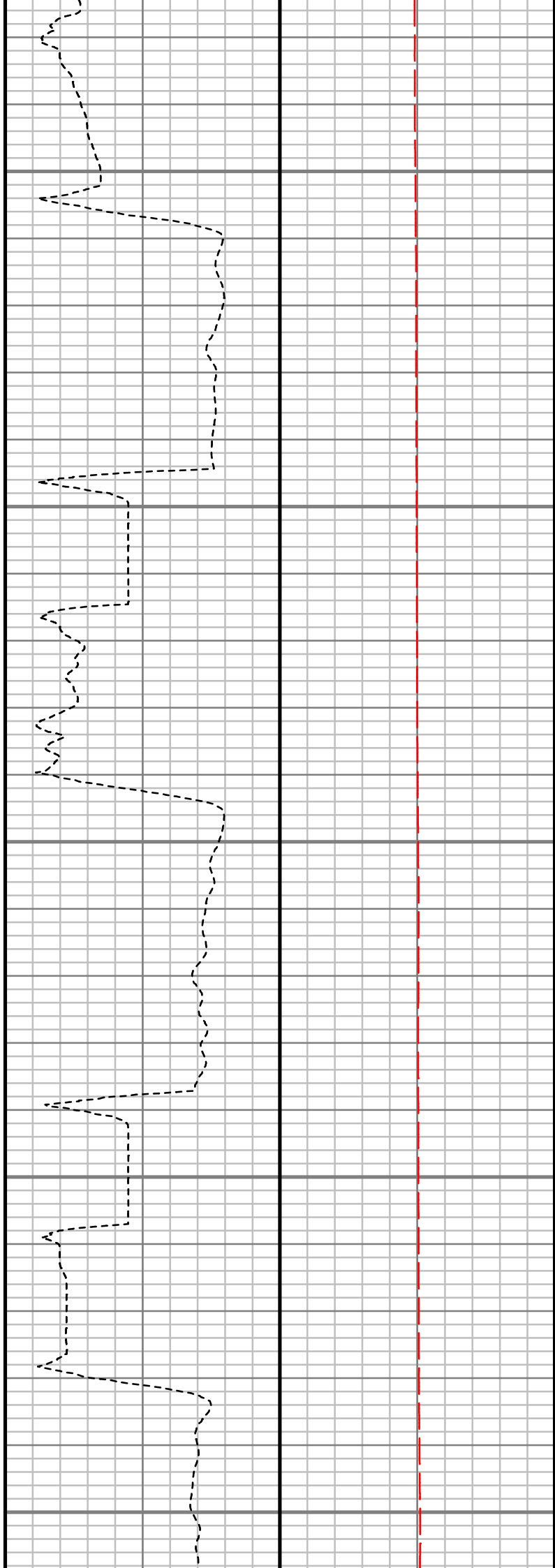
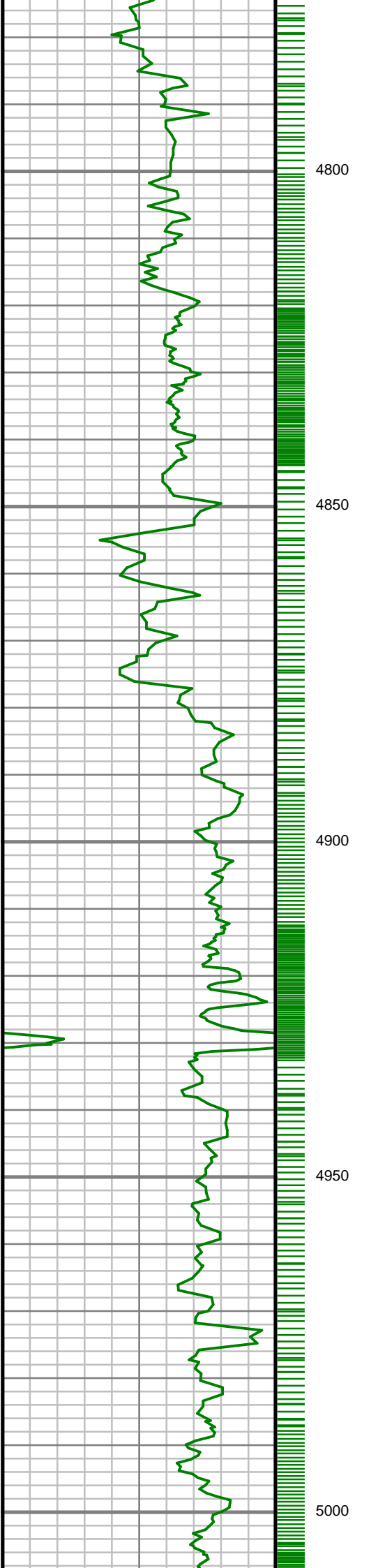


S: 42 MD: 4319.00 ft
Inc: 16.09 deg Az: 2.47
deg TVD: 4189.56 ft

S: 43 MD: 4414.00 ft
Inc: 16.35 deg Az:
358.88 deg TVD:
4280.78 ft

S: 44 MD: 4507.00 ft
Inc: 17.26 deg Az: 2.72
deg TVD: 4369.81 ft

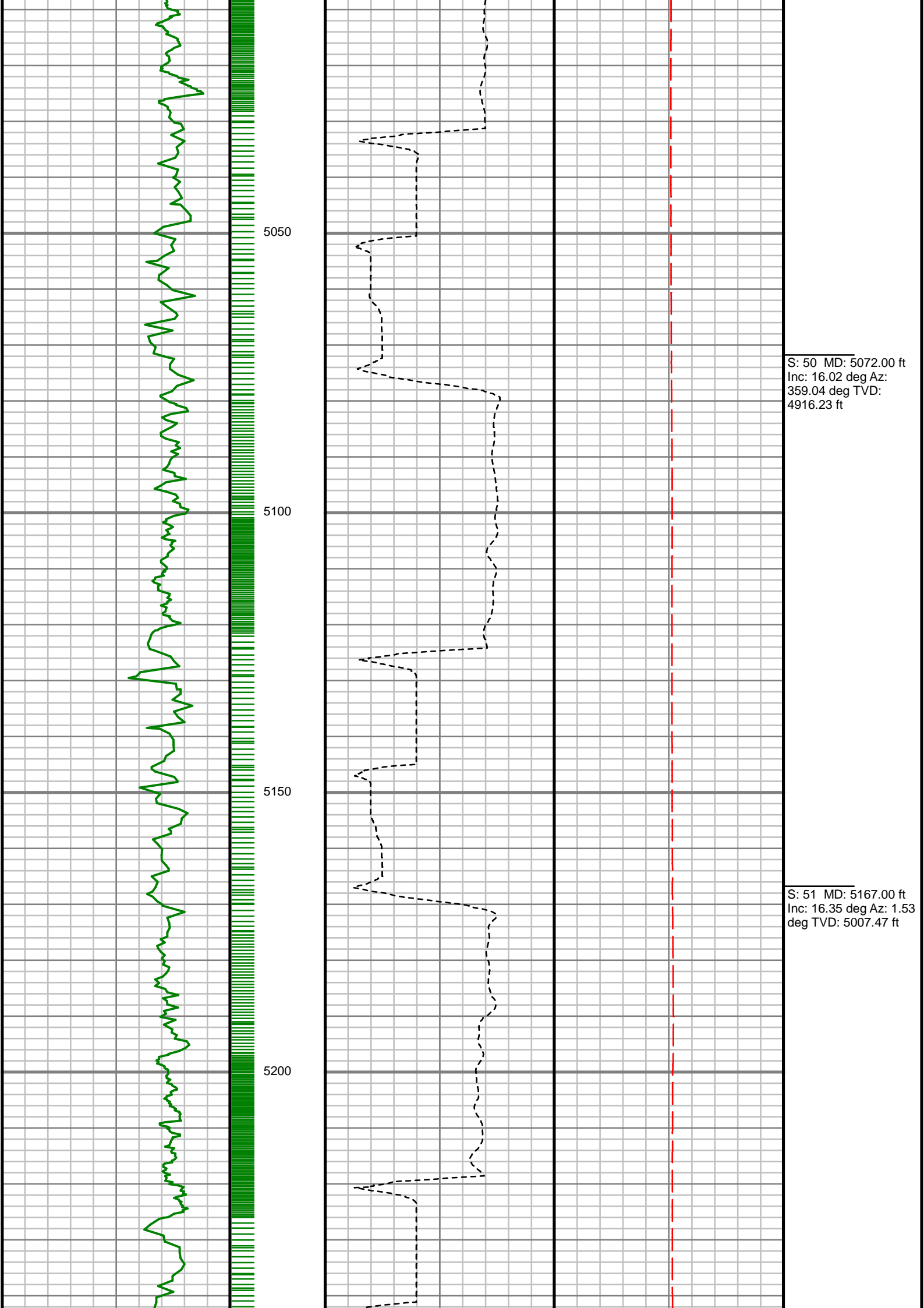


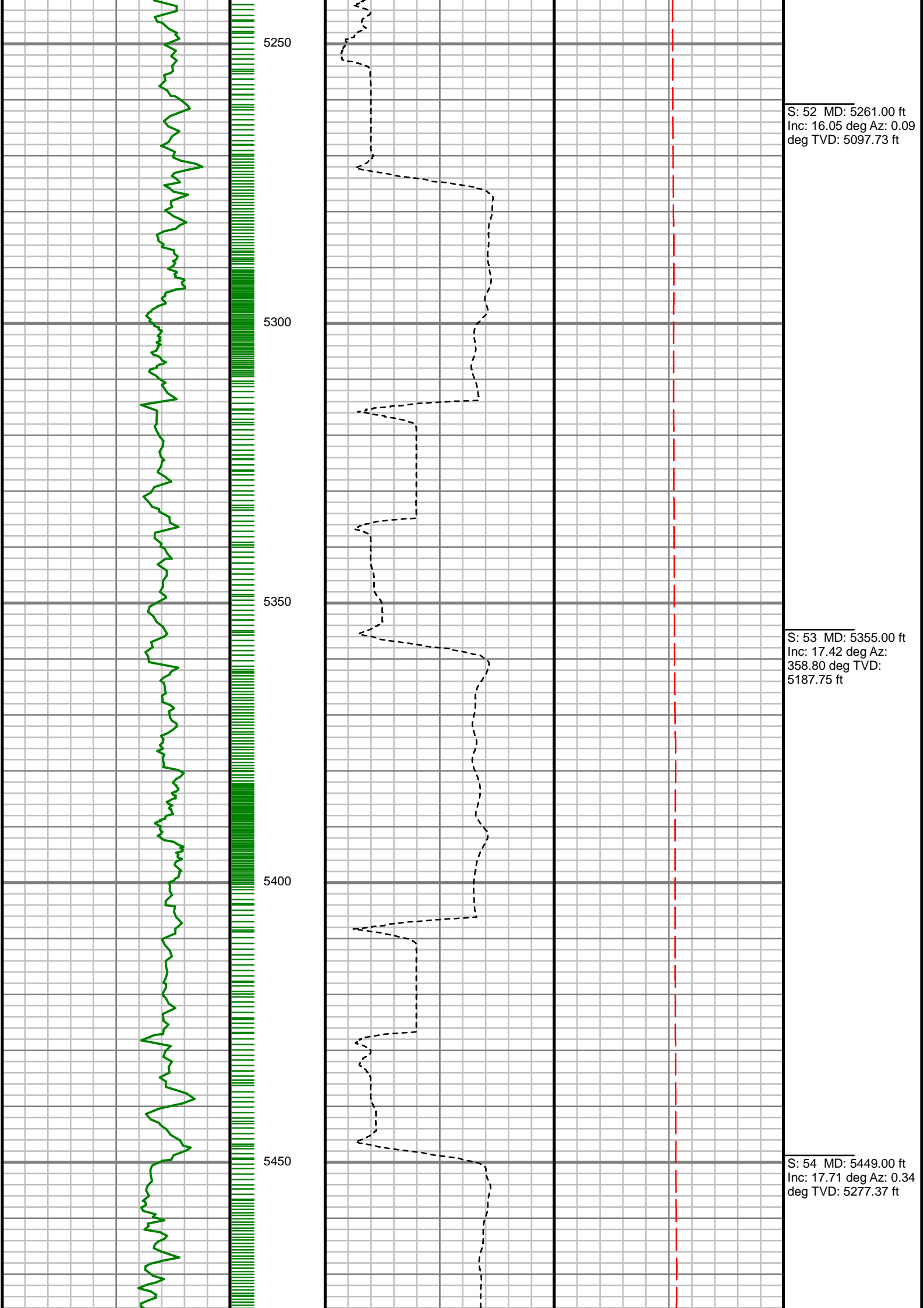


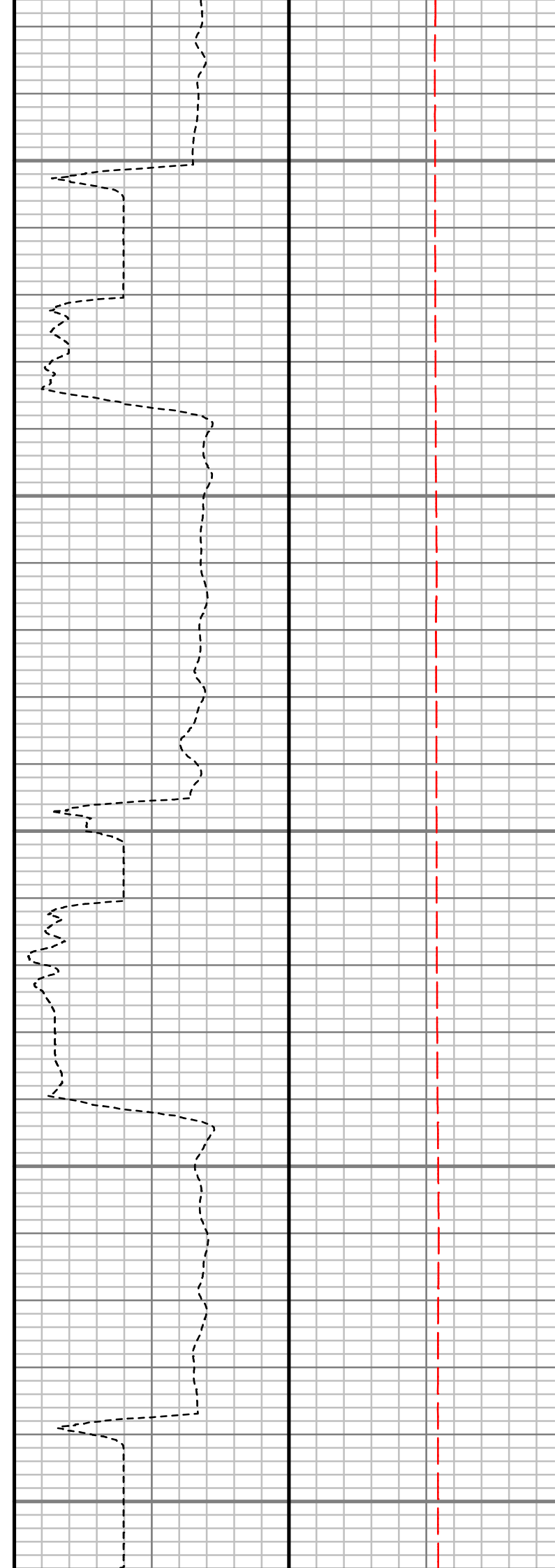
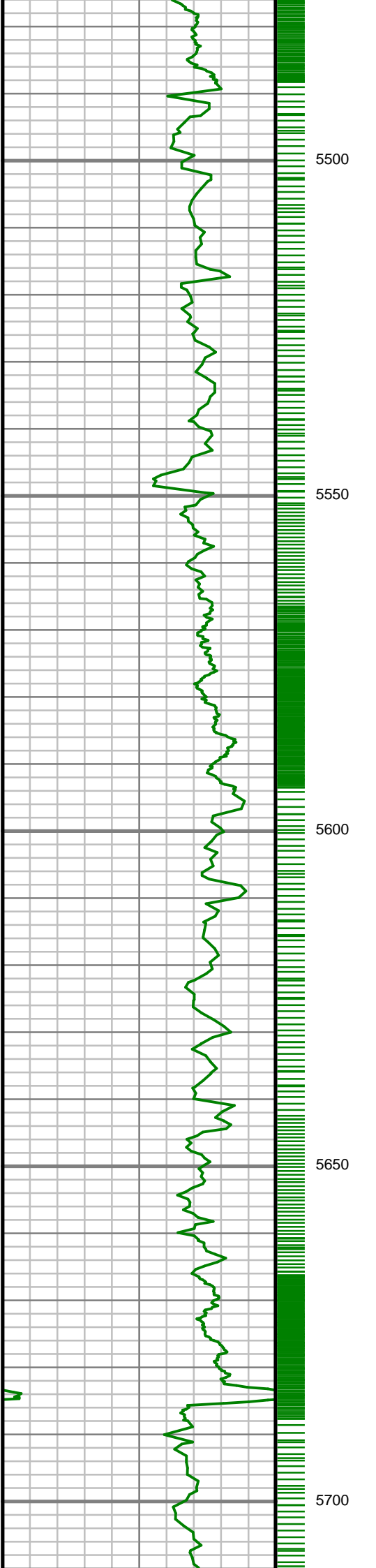
S: 47 MD: 4791.00 ft
Inc: 14.28 deg Az: 2.75
deg TVD: 4644.72 ft

S: 48 MD: 4886.00 ft
Inc: 14.41 deg Az:
349.87 deg TVD:
4736.78 ft

S: 49 MD: 4979.00 ft
Inc: 15.29 deg Az:
356.31 deg TVD:
4826.68 ft

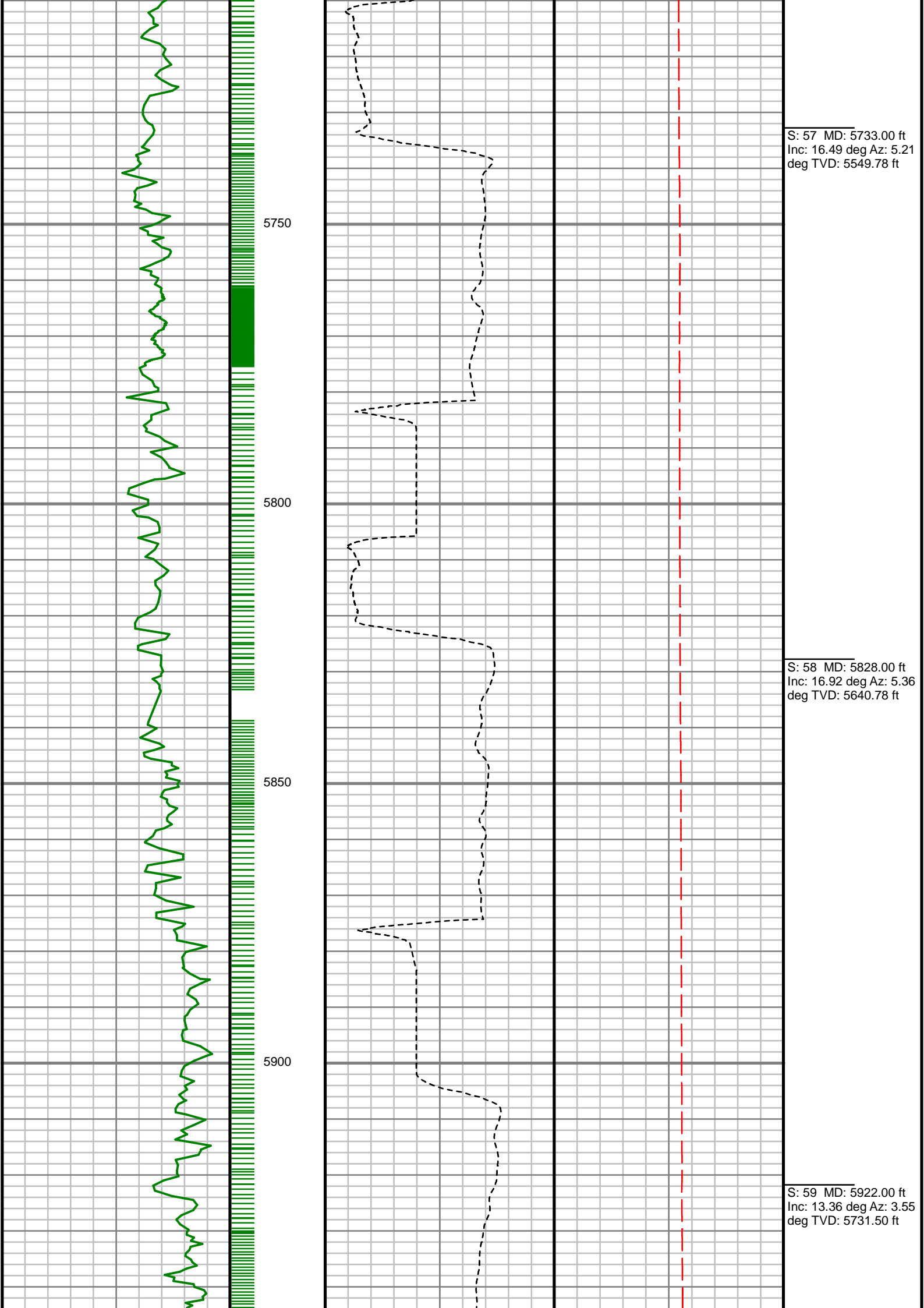


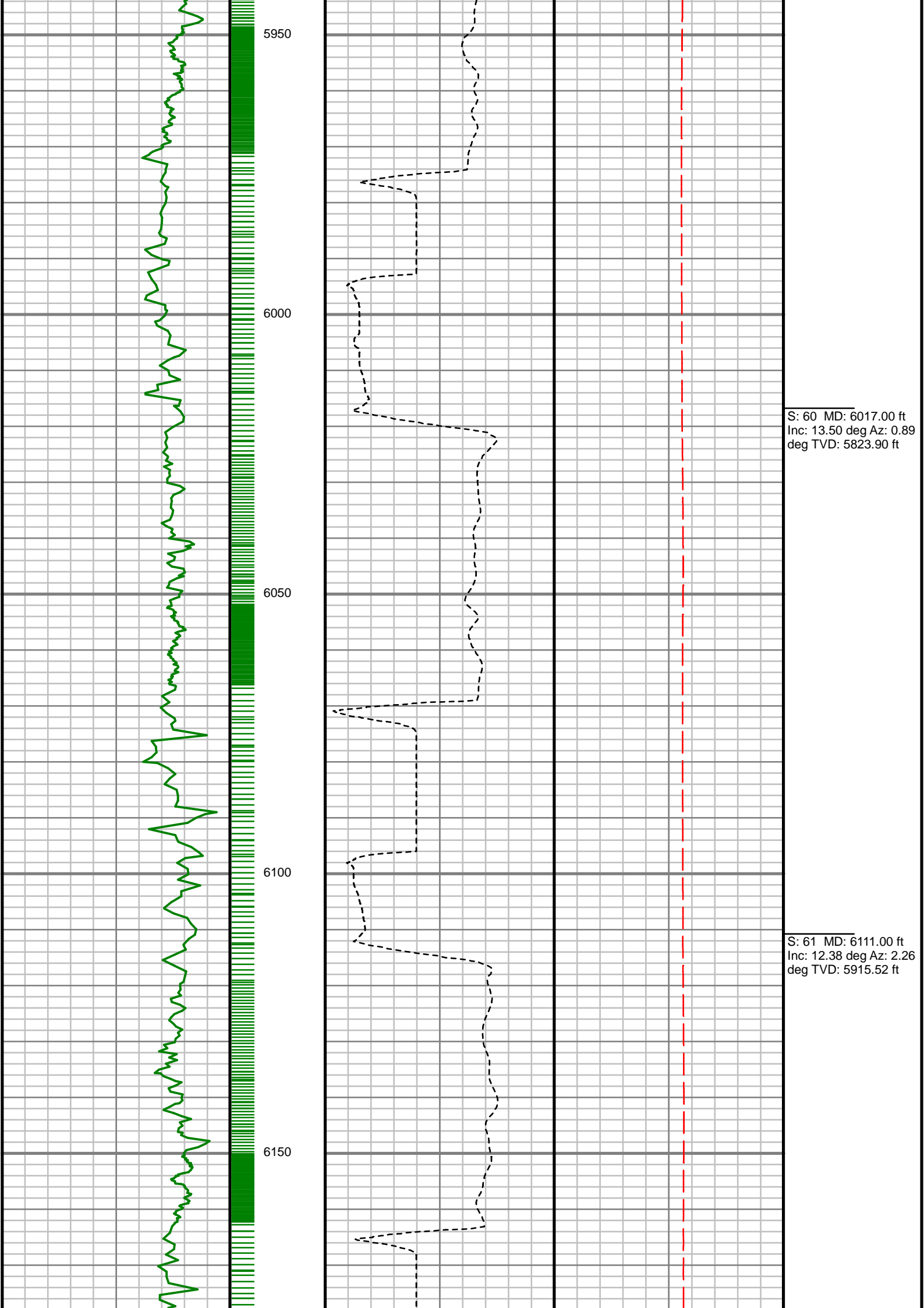


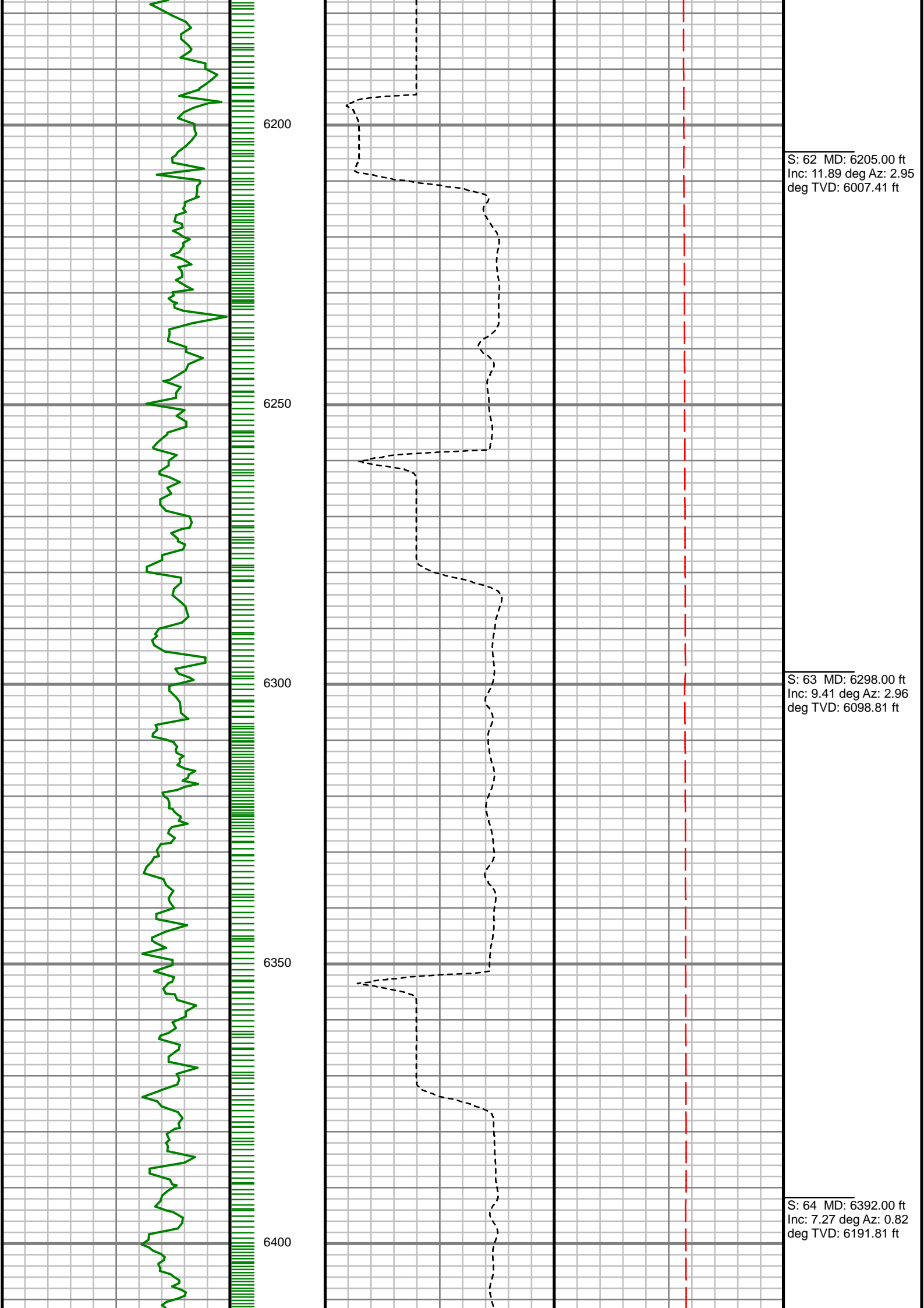


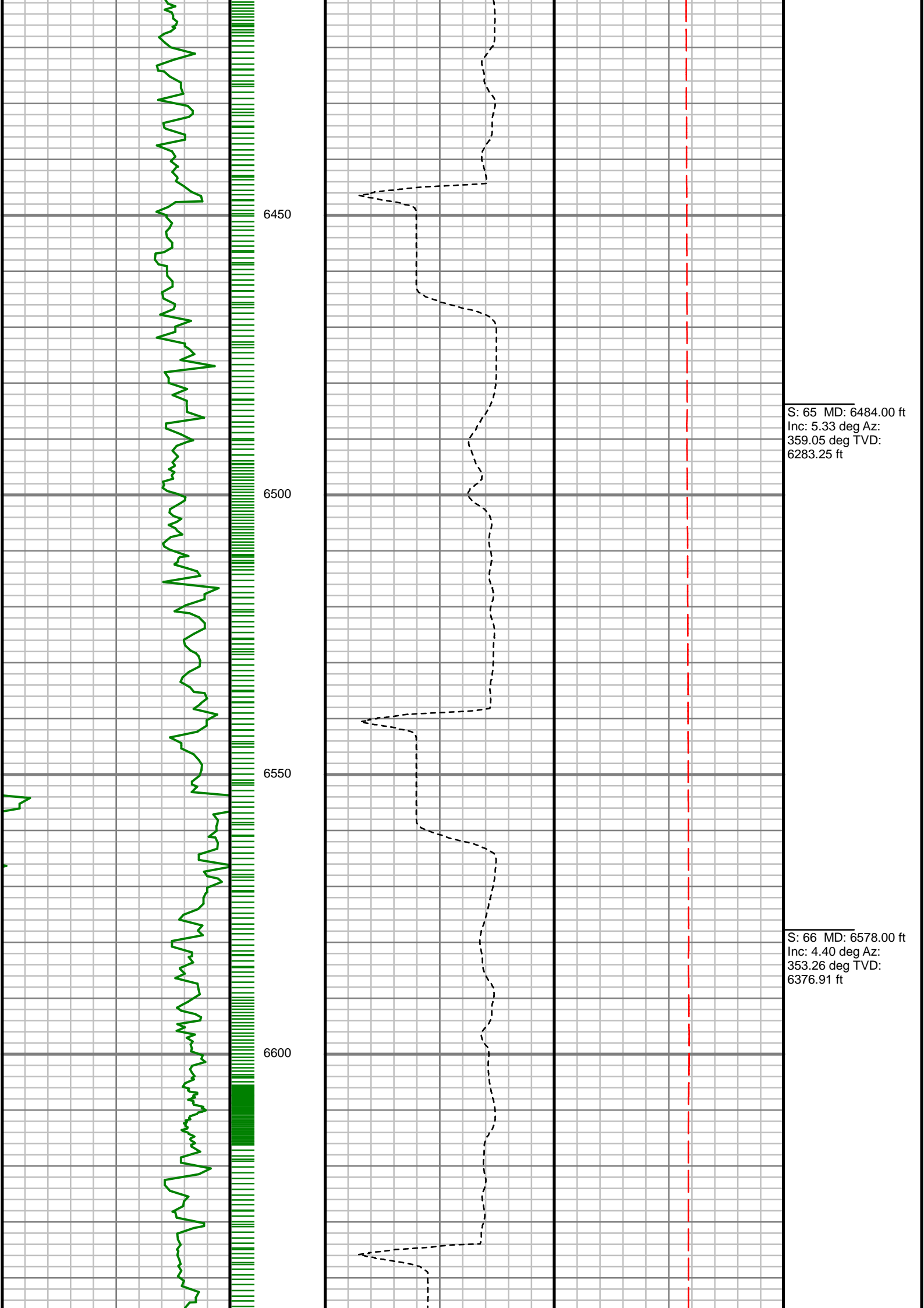
S: 55 MD: 5542.00 ft
Inc: 16.14 deg Az: 356.73 deg TVD: 5366.34 ft

S: 56 MD: 5637.00 ft
Inc: 16.03 deg Az: 0.42 deg TVD: 5457.62 ft



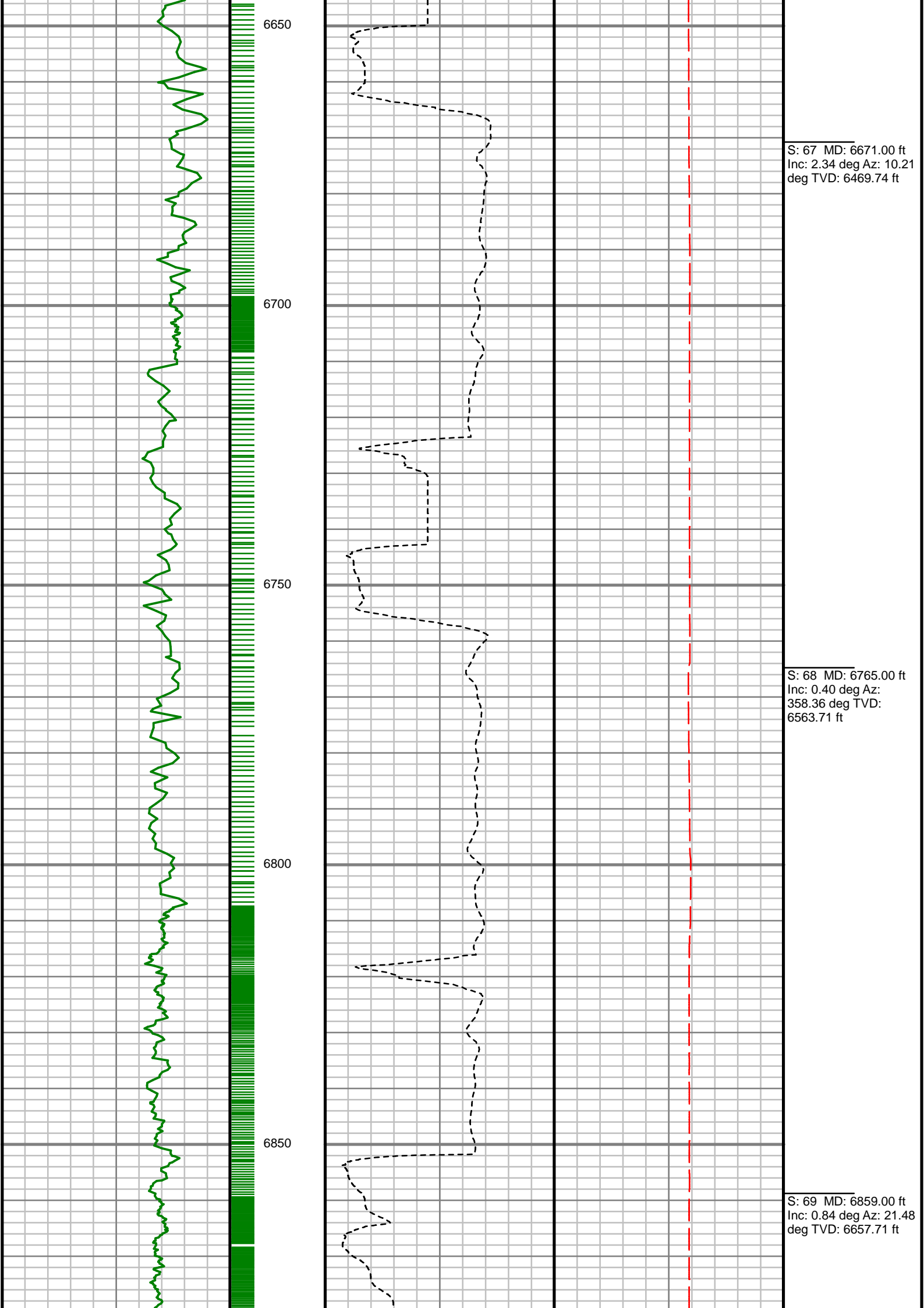


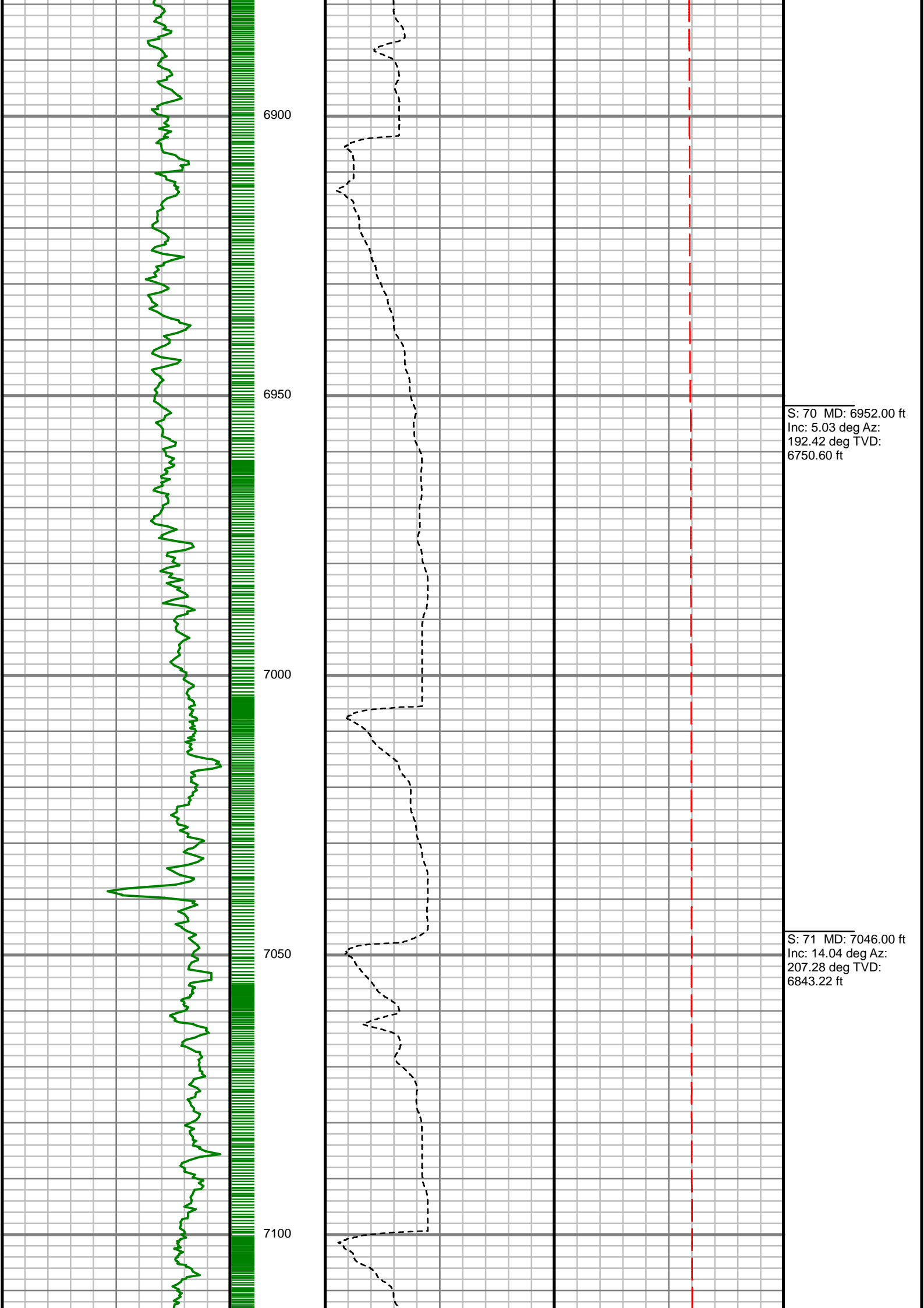


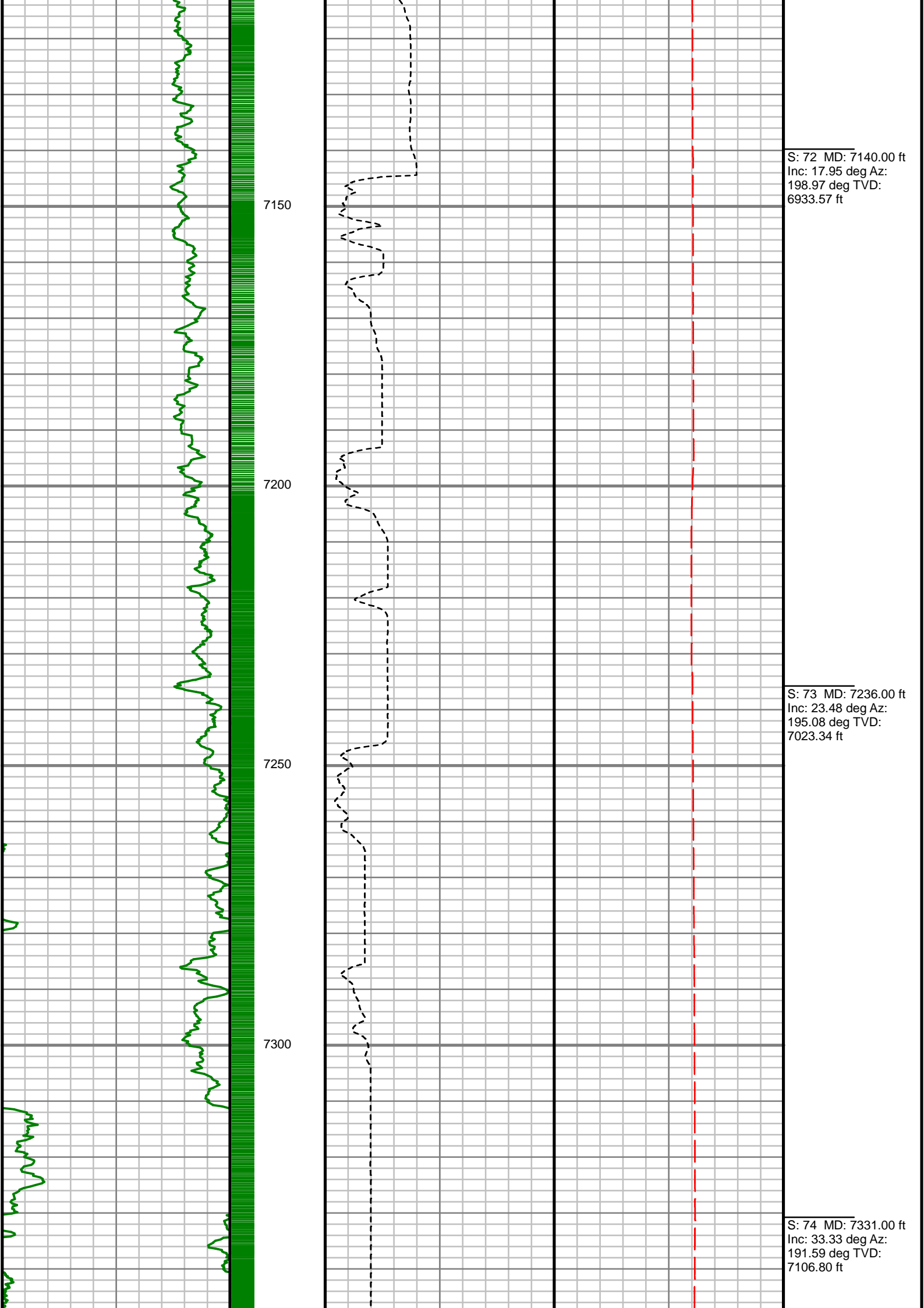


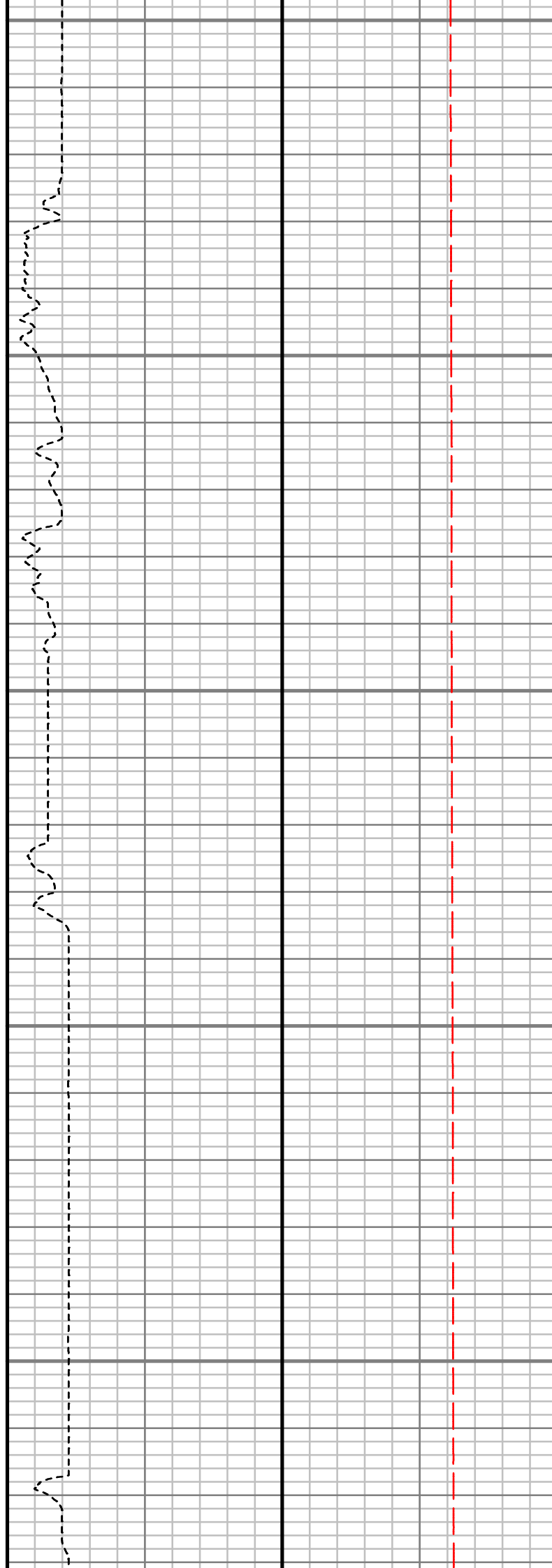
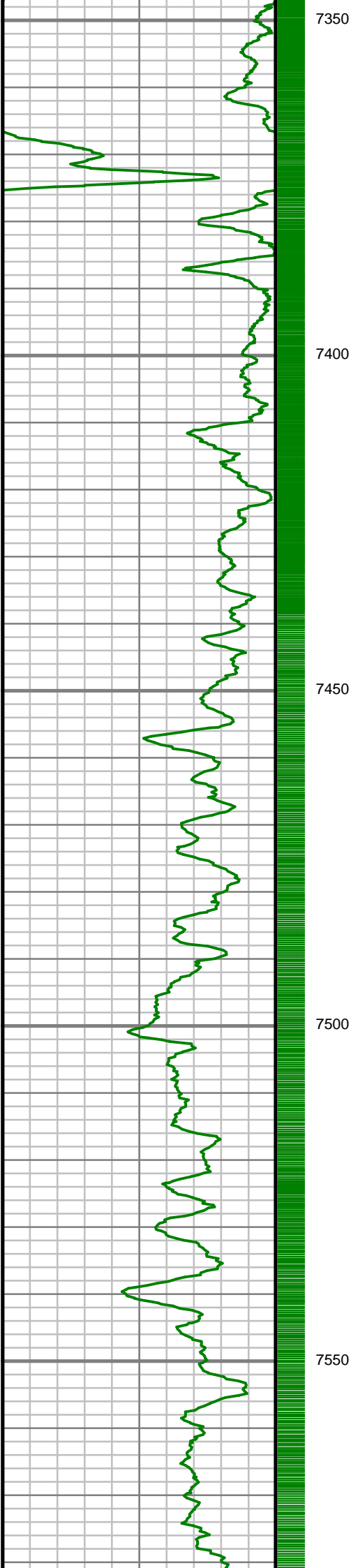
S: 65 MD: 6484.00 ft
Inc: 5.33 deg Az:
359.05 deg TVD:
6283.25 ft

S: 66 MD: 6578.00 ft
Inc: 4.40 deg Az:
353.26 deg TVD:
6376.91 ft



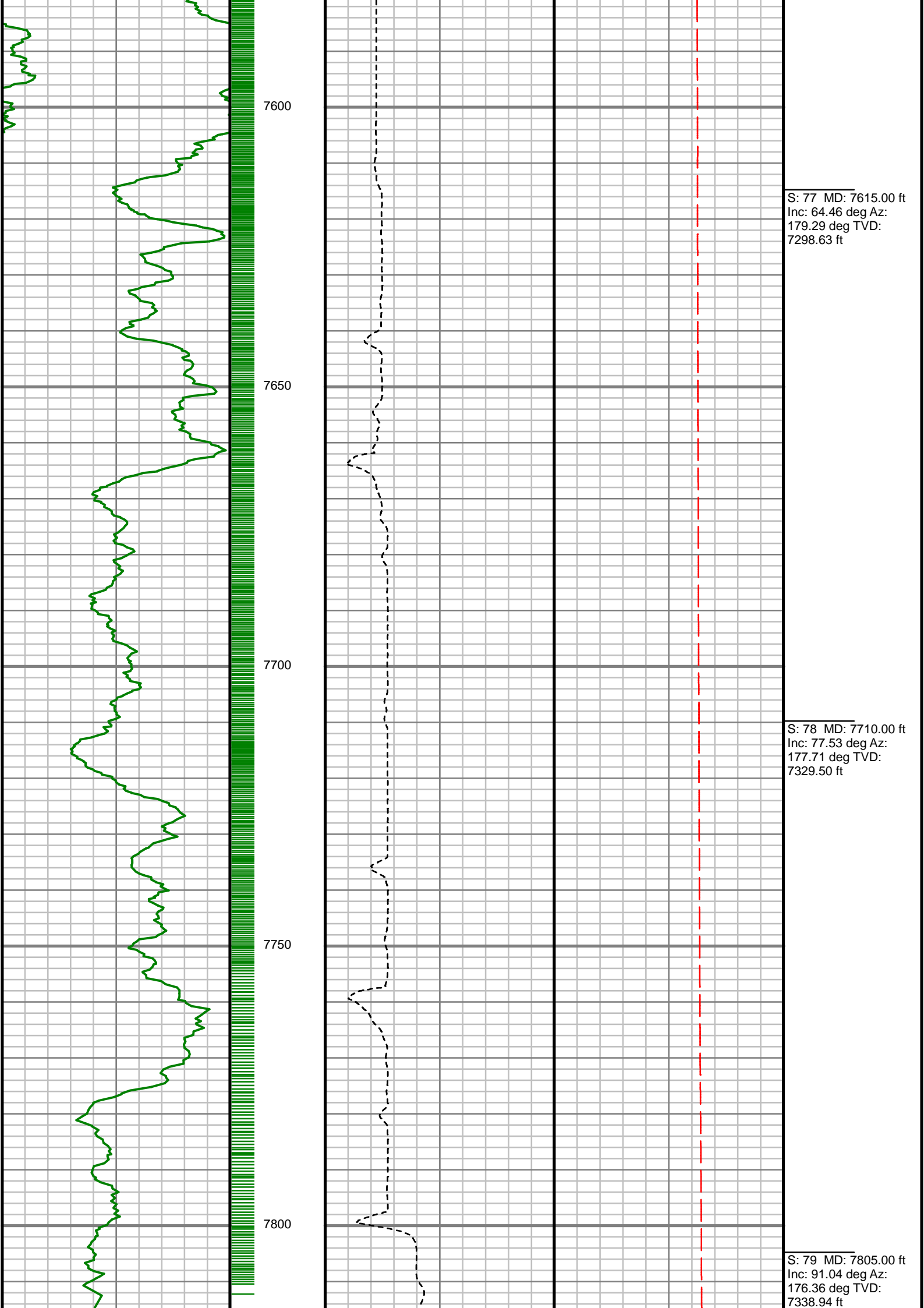


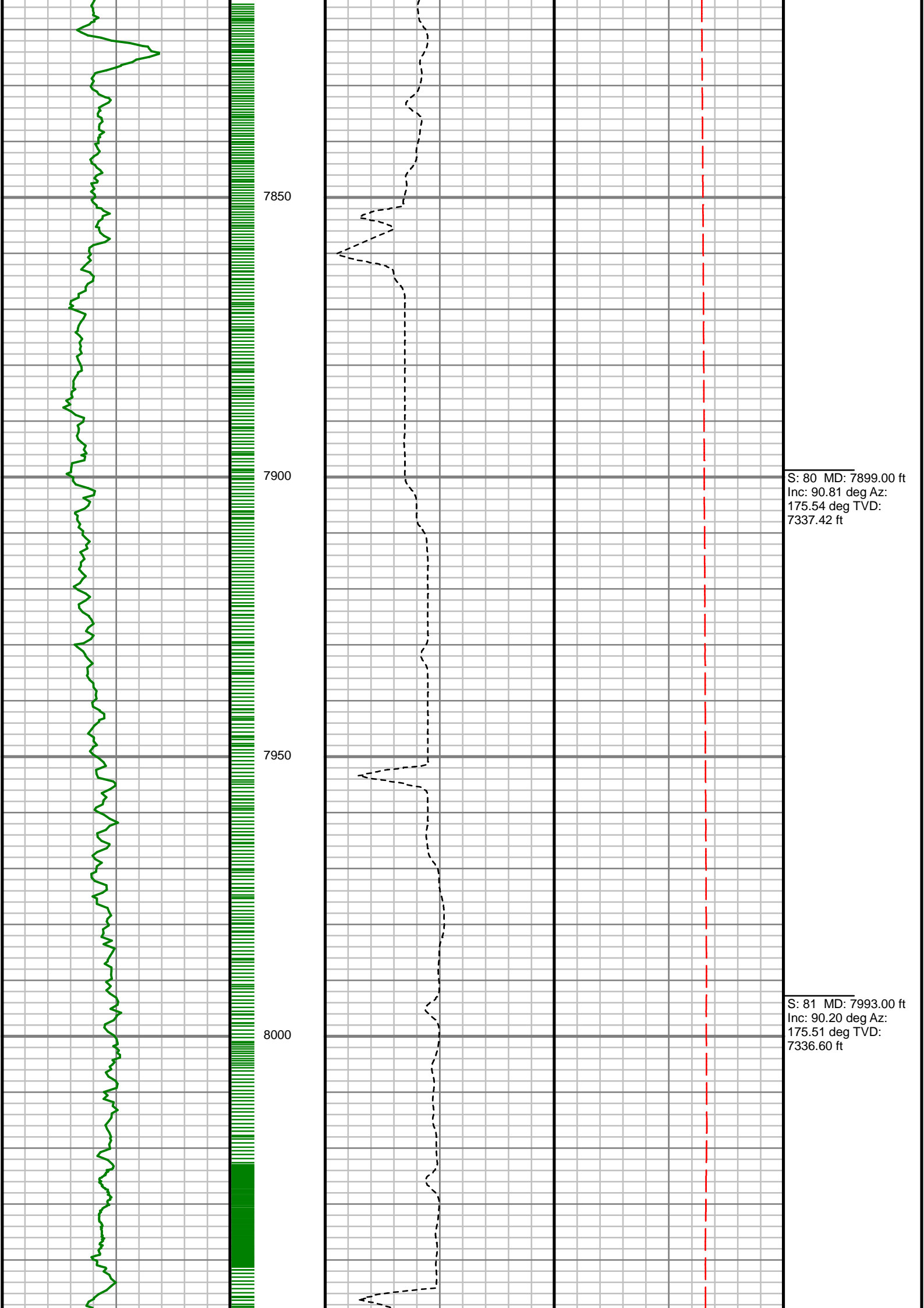




S: 75 MD: 7426.00 ft
Inc: 40.67 deg Az:
183.82 deg TVD:
7182.66 ft

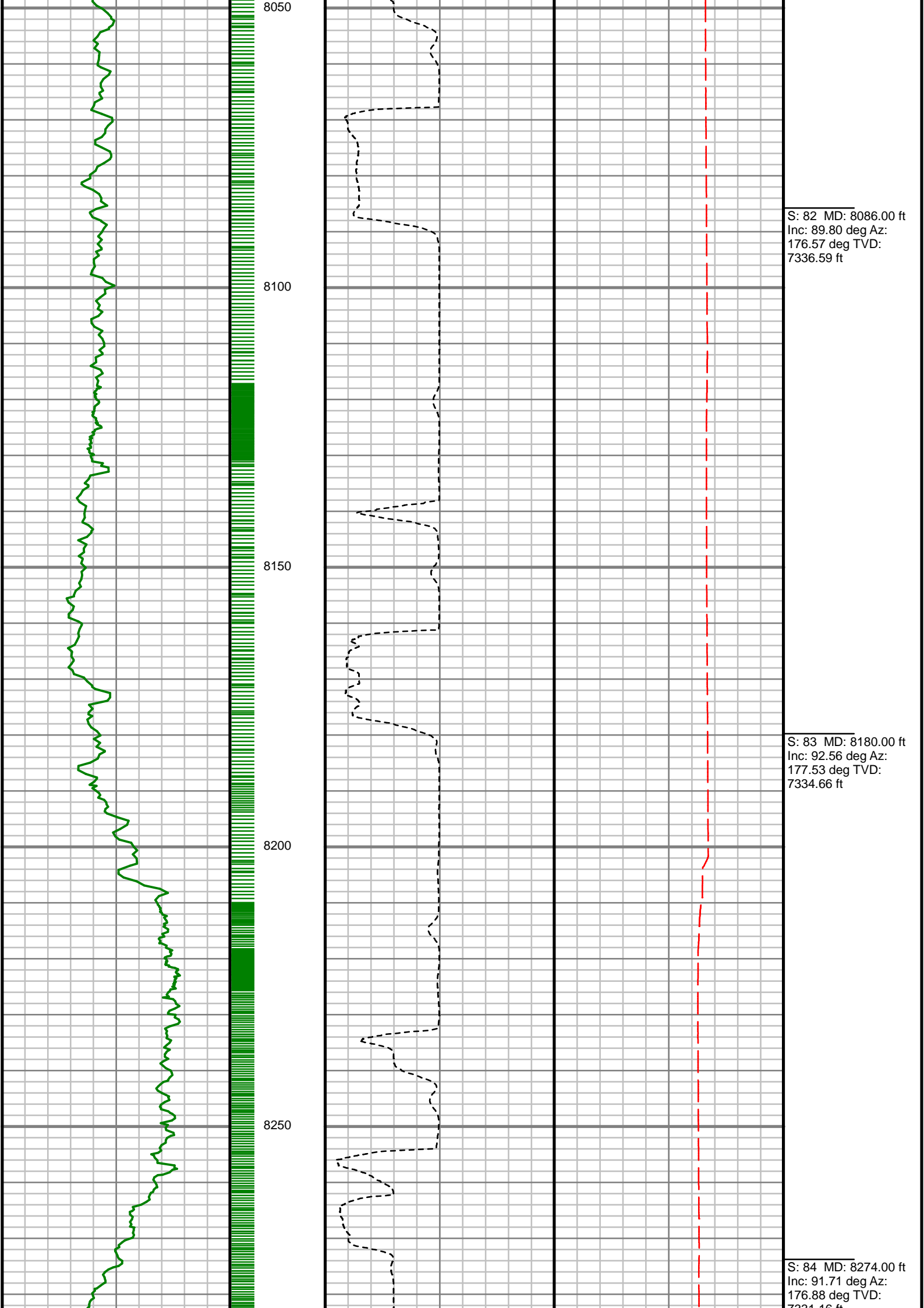
S: 76 MD: 7520.00 ft
Inc: 51.04 deg Az:
180.63 deg TVD:
7248.05 ft

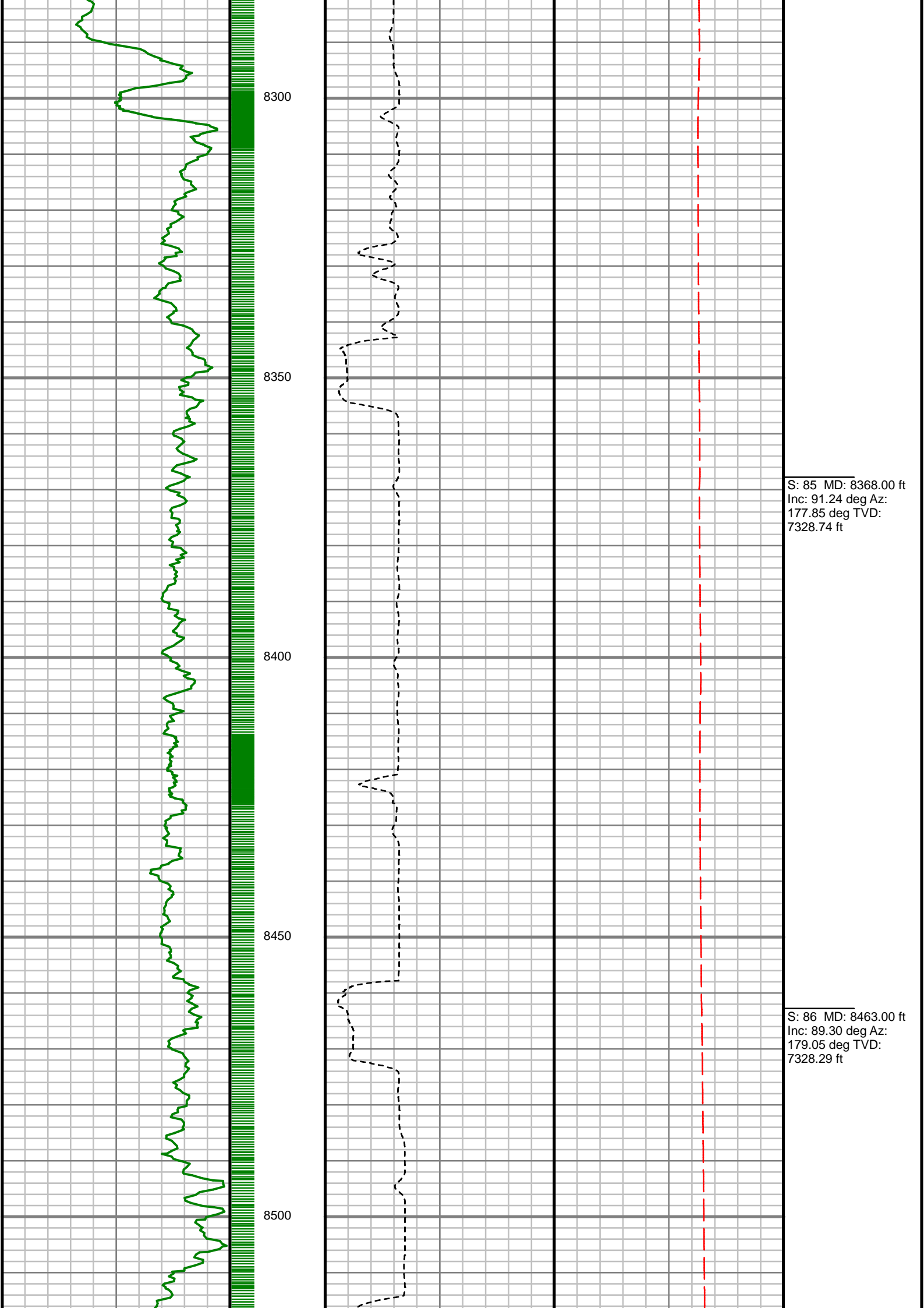


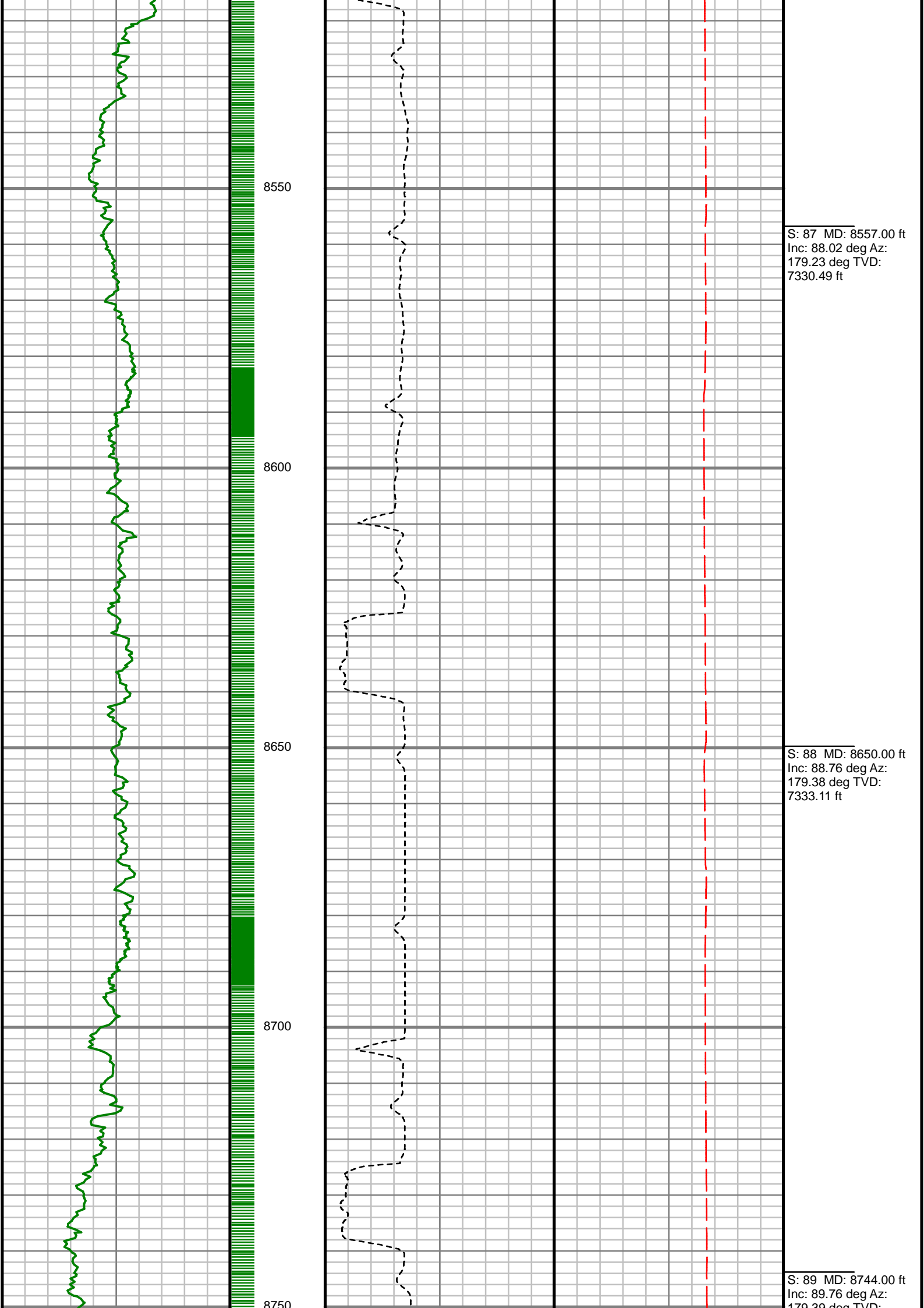


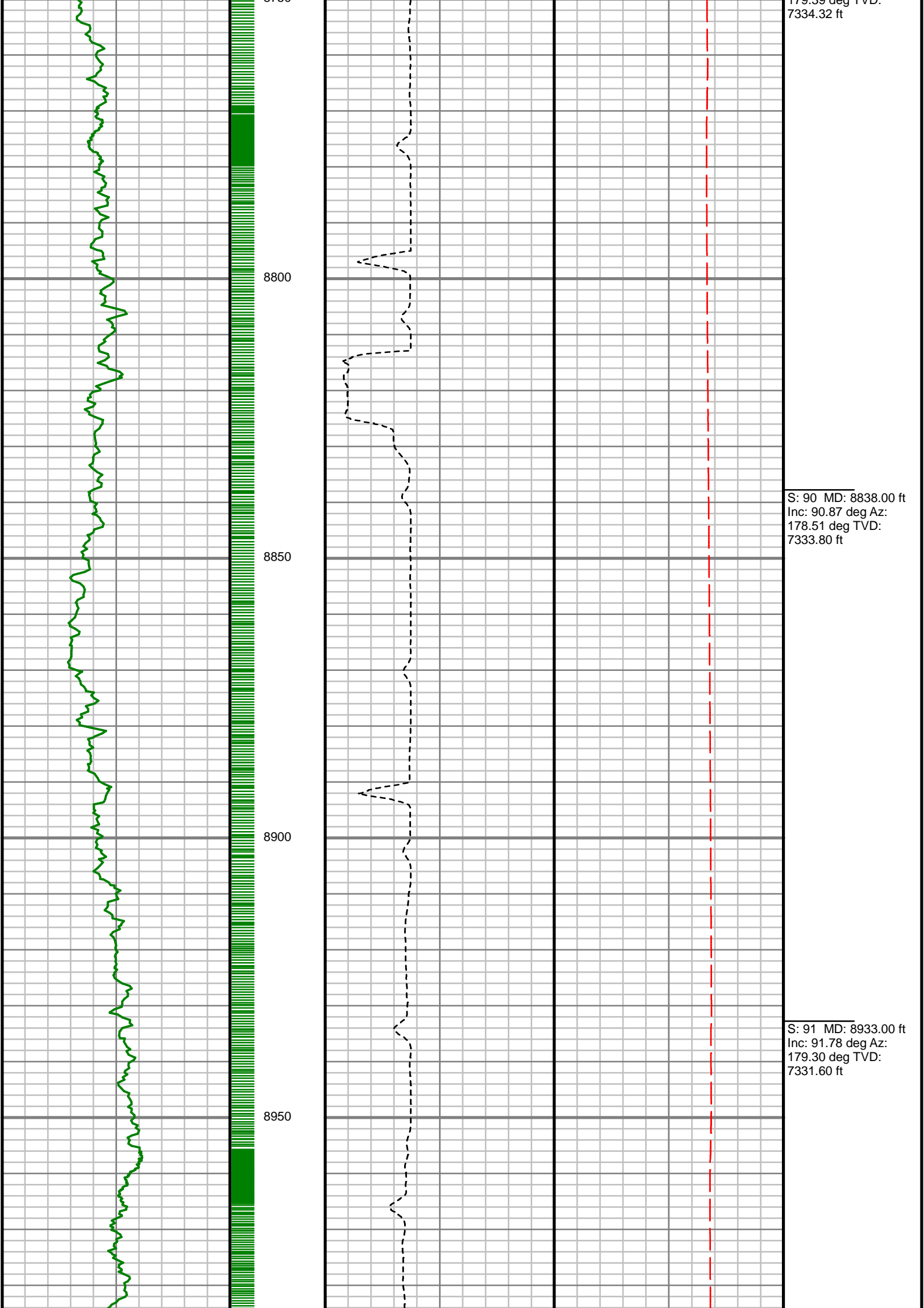
S: 80 MD: 7899.00 ft
Inc: 90.81 deg Az:
175.54 deg TVD:
7337.42 ft

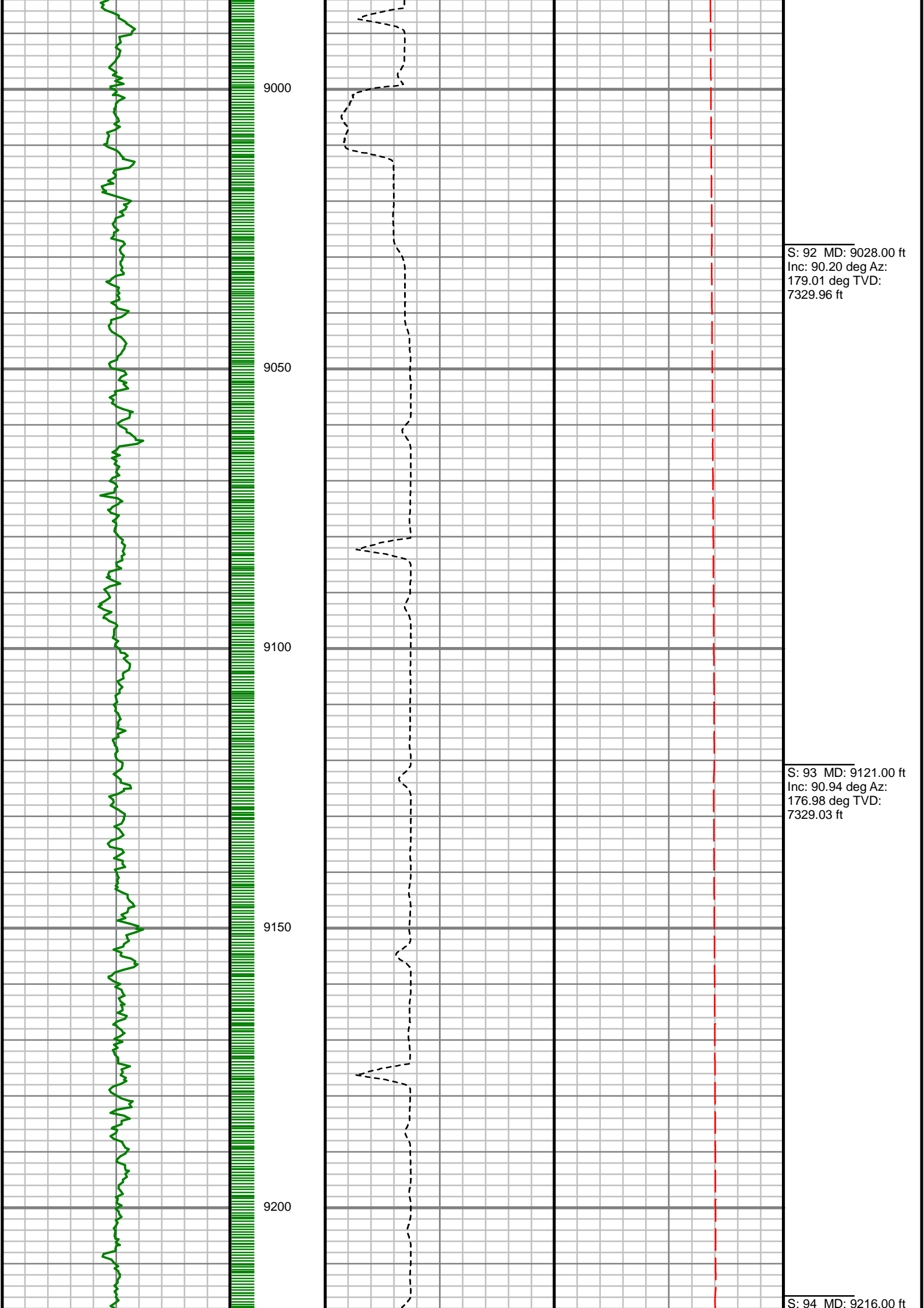
S: 81 MD: 7993.00 ft
Inc: 90.20 deg Az:
175.51 deg TVD:
7336.60 ft

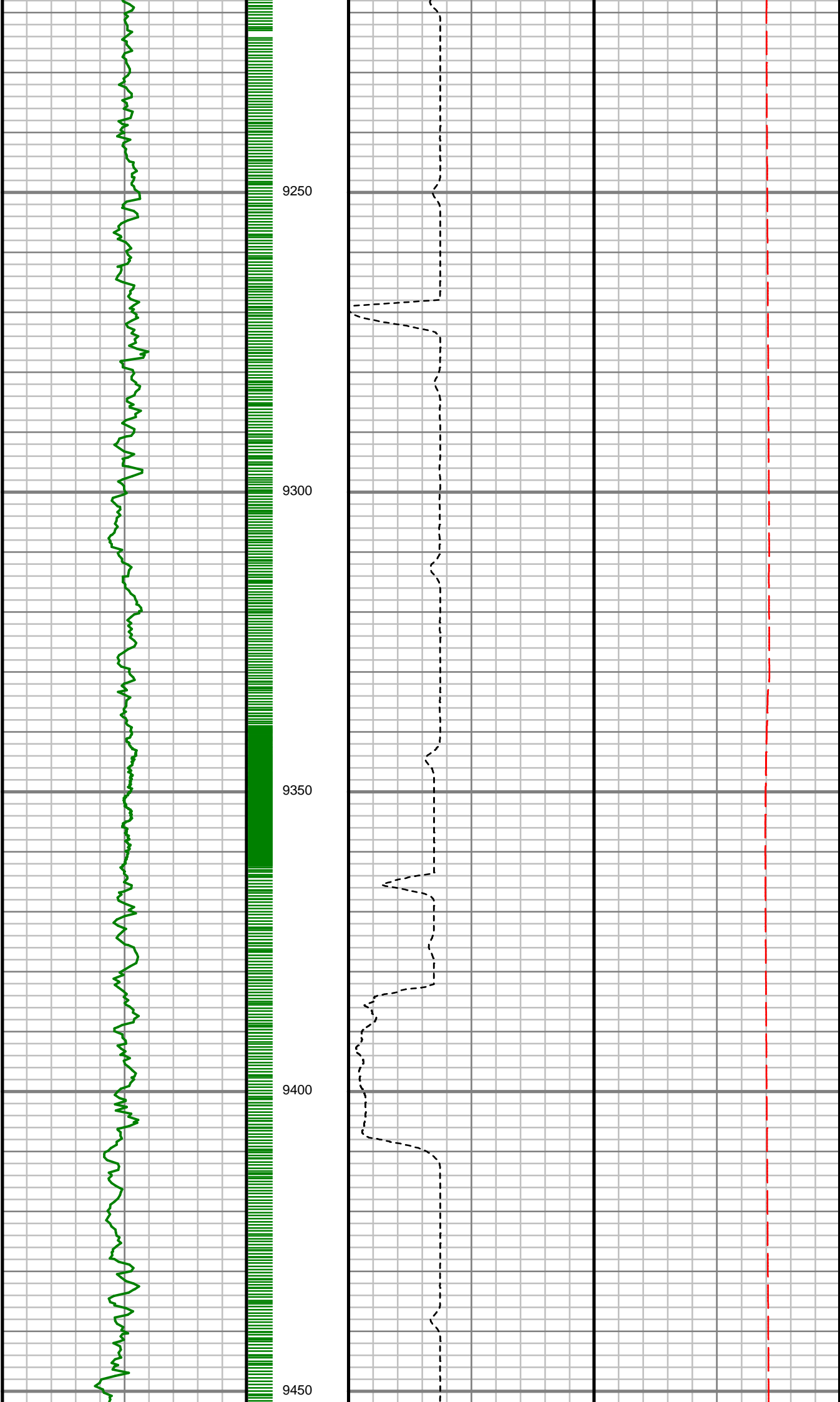








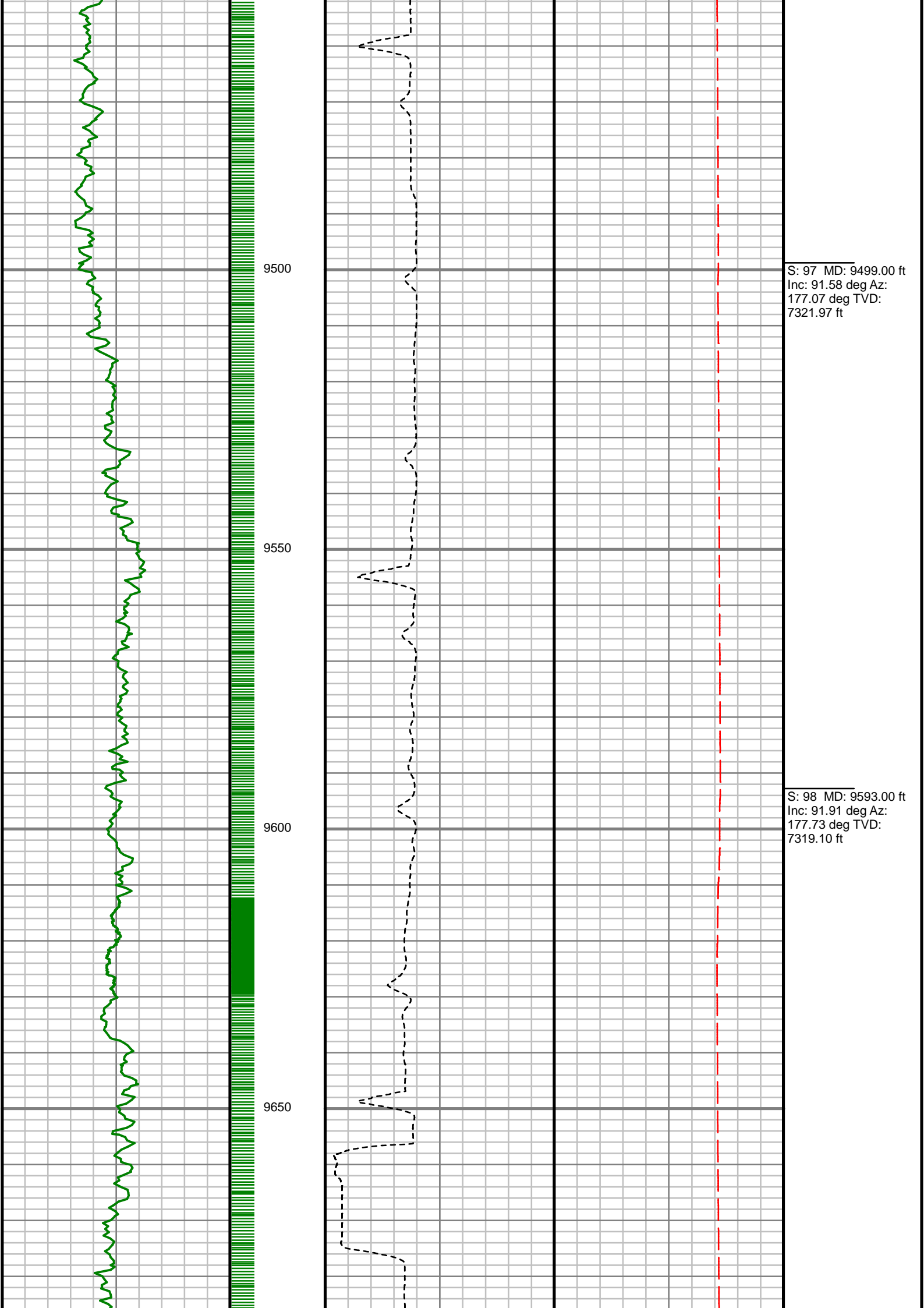


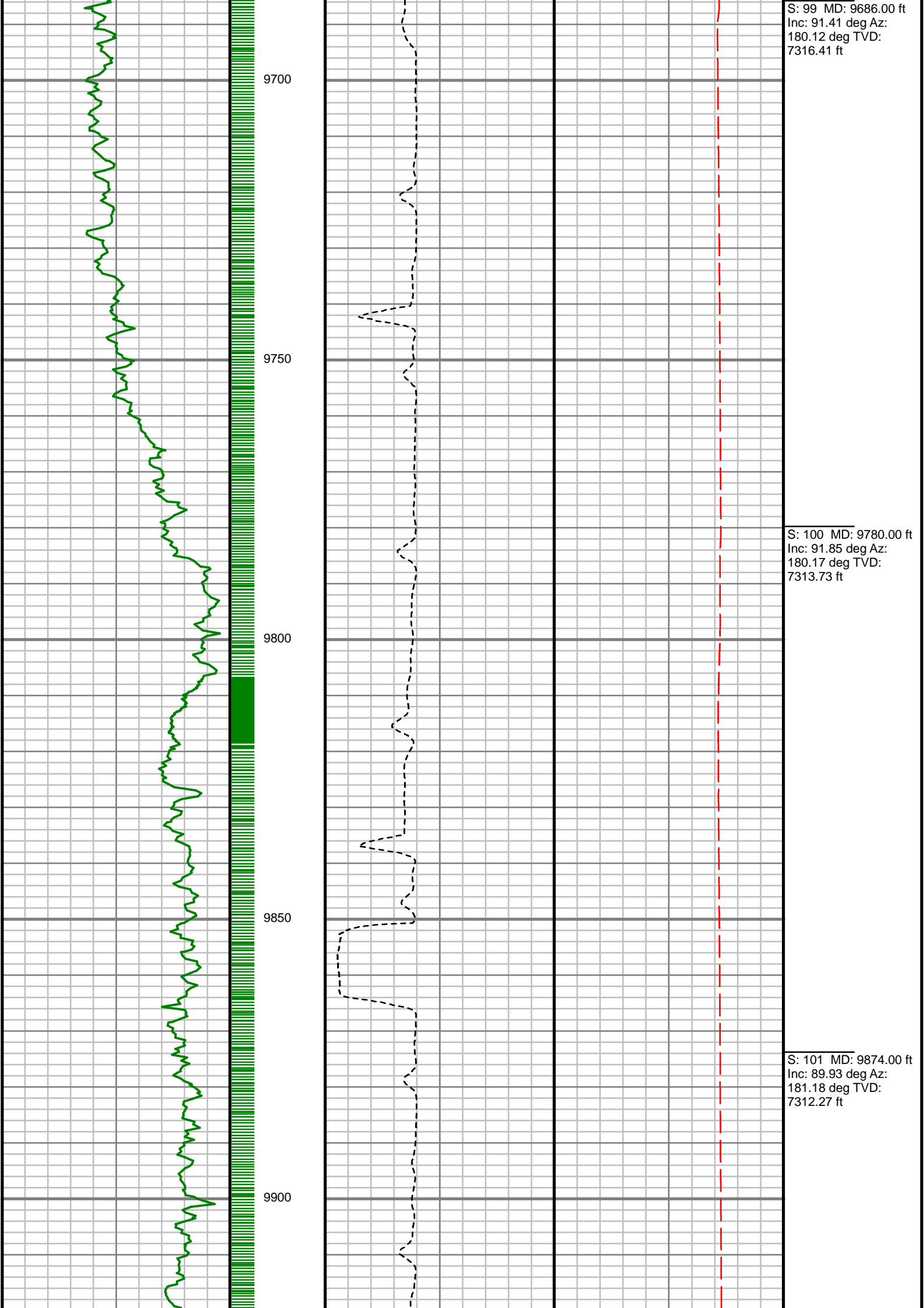


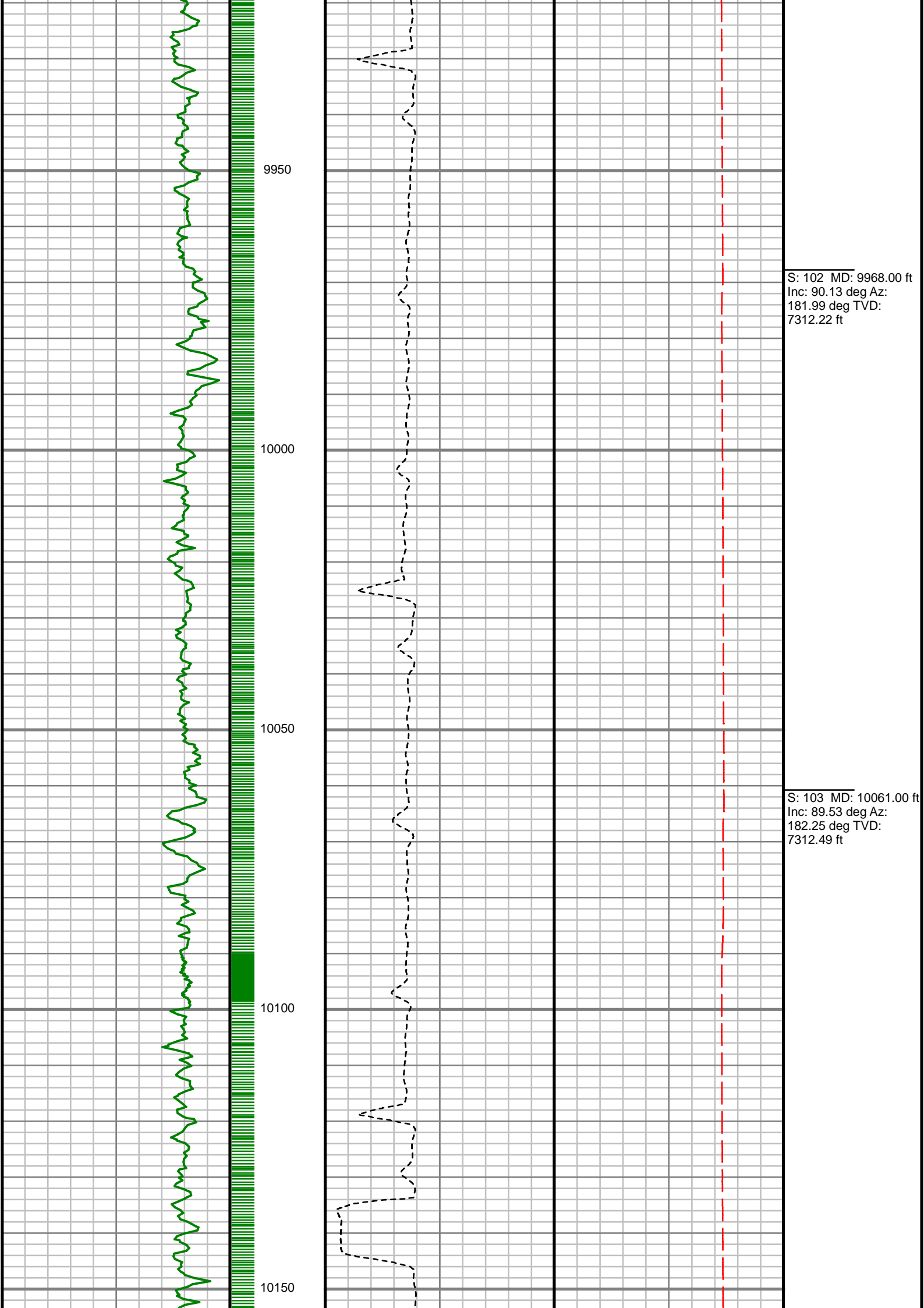
Inc: 90.57 deg Az:
176.54 deg TVD:
7327.78 ft

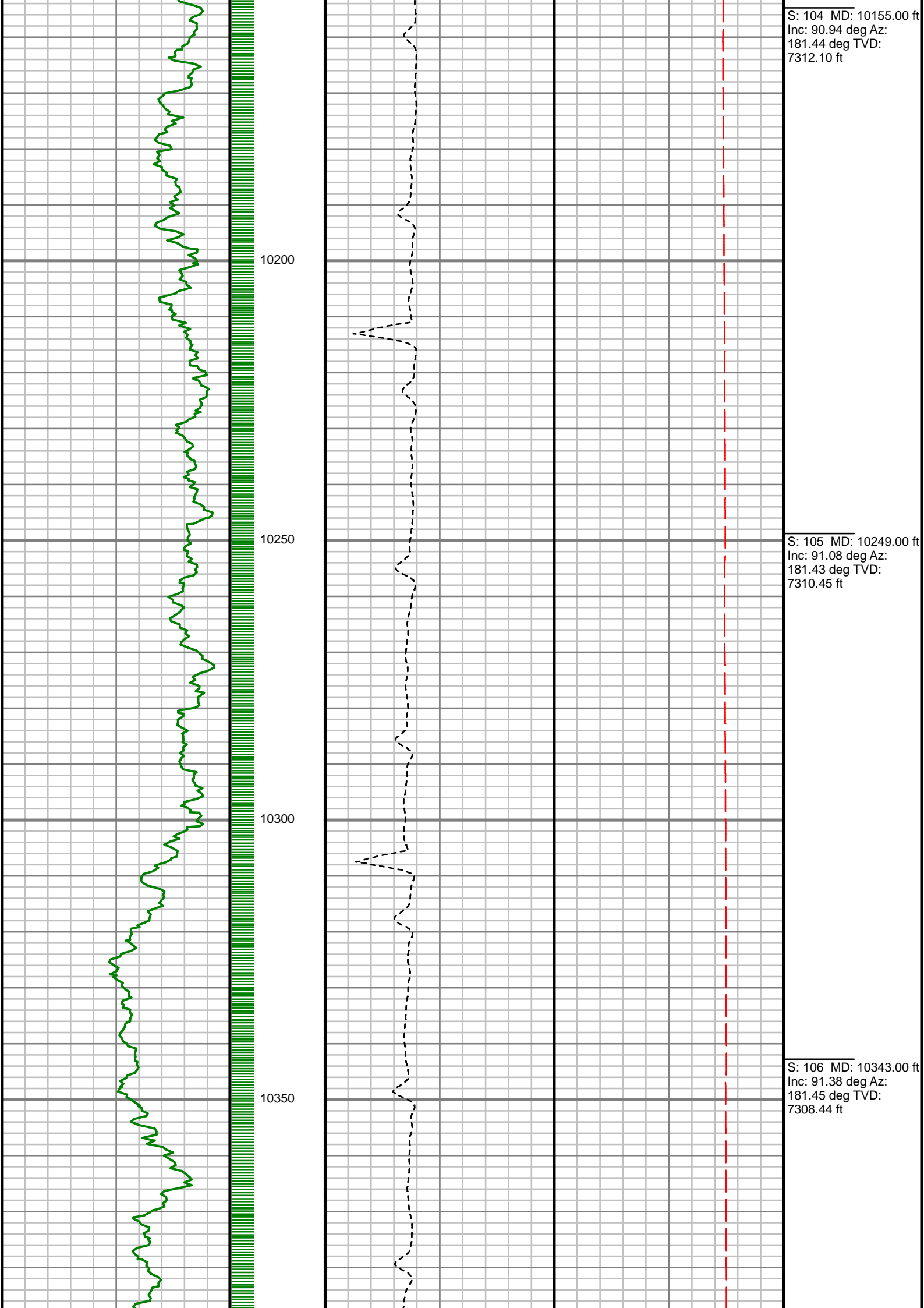
S: 95 MD: 9310.00 ft
Inc: 90.77 deg Az:
174.22 deg TVD:
7326.68 ft

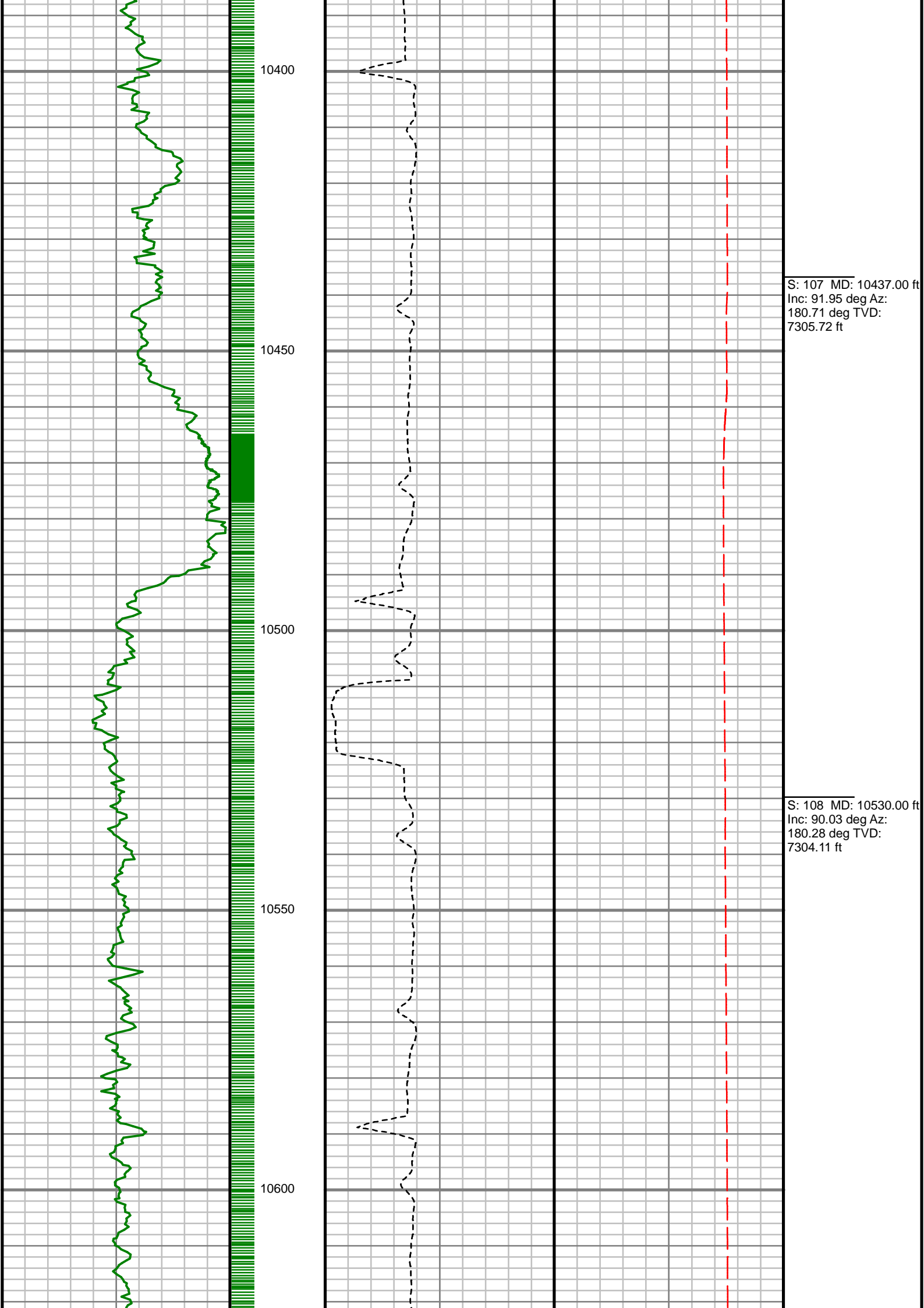
S: 96 MD: 9404.00 ft
Inc: 91.68 deg Az:
177.15 deg TVD:
7324.67 ft

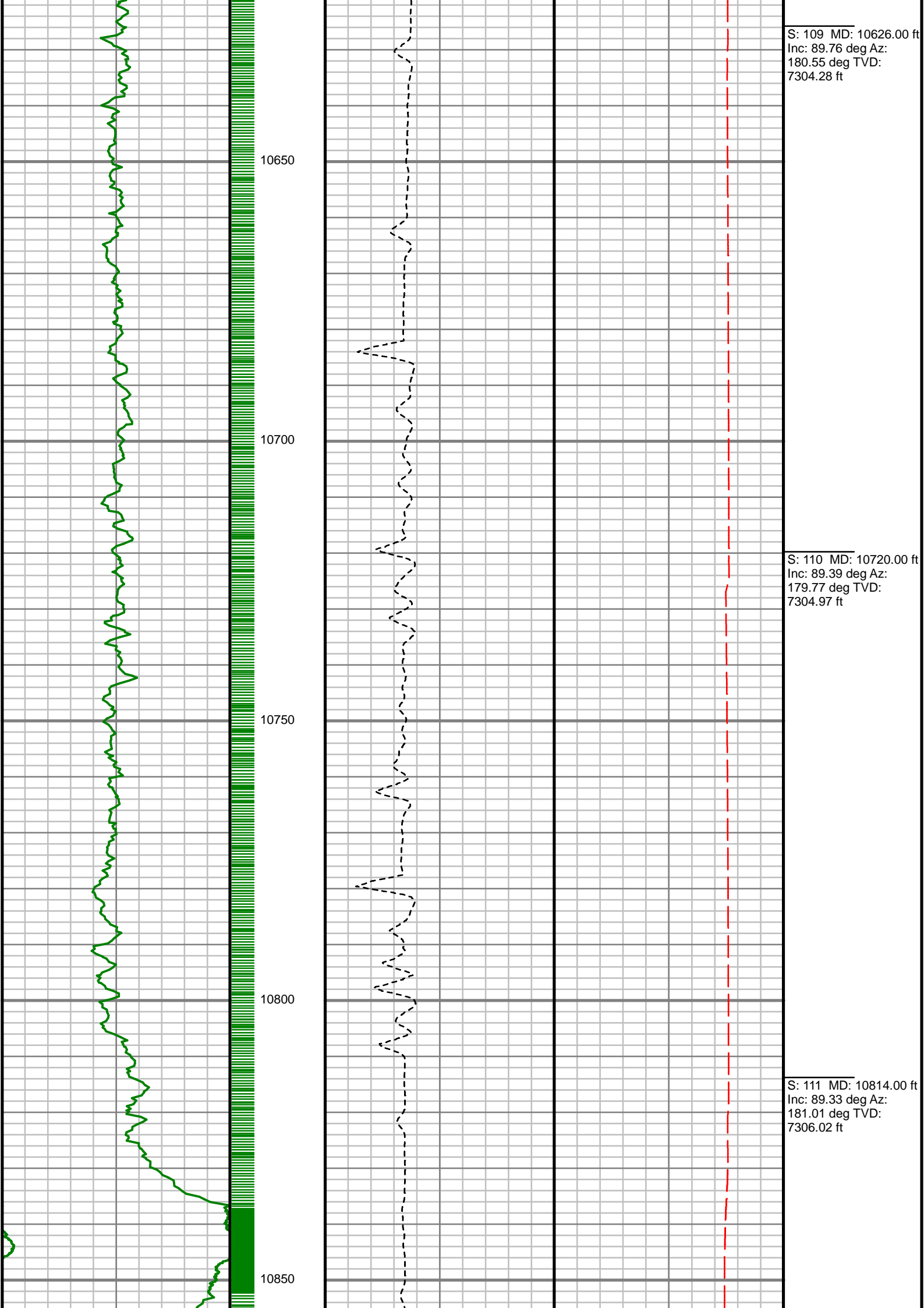


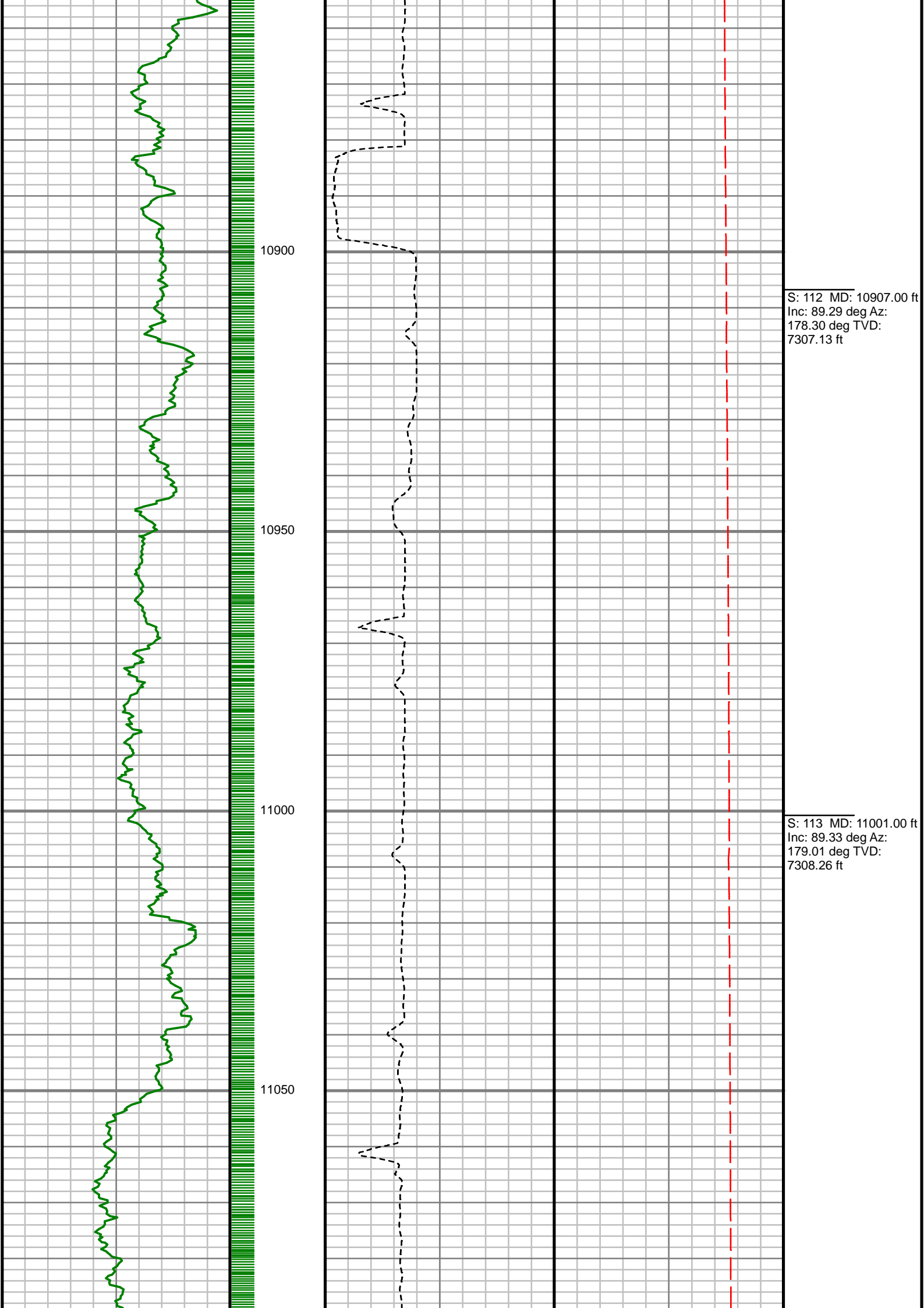






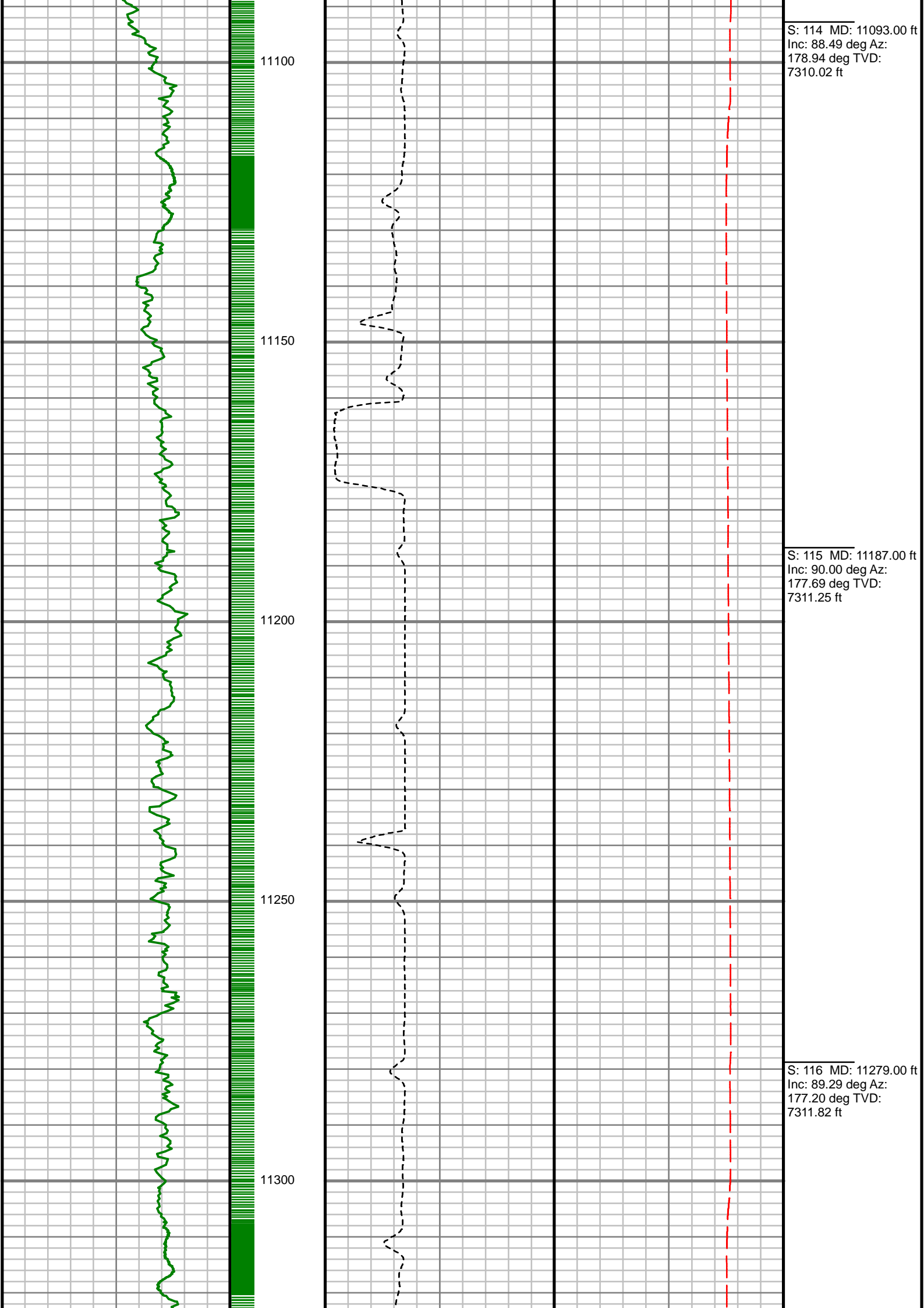


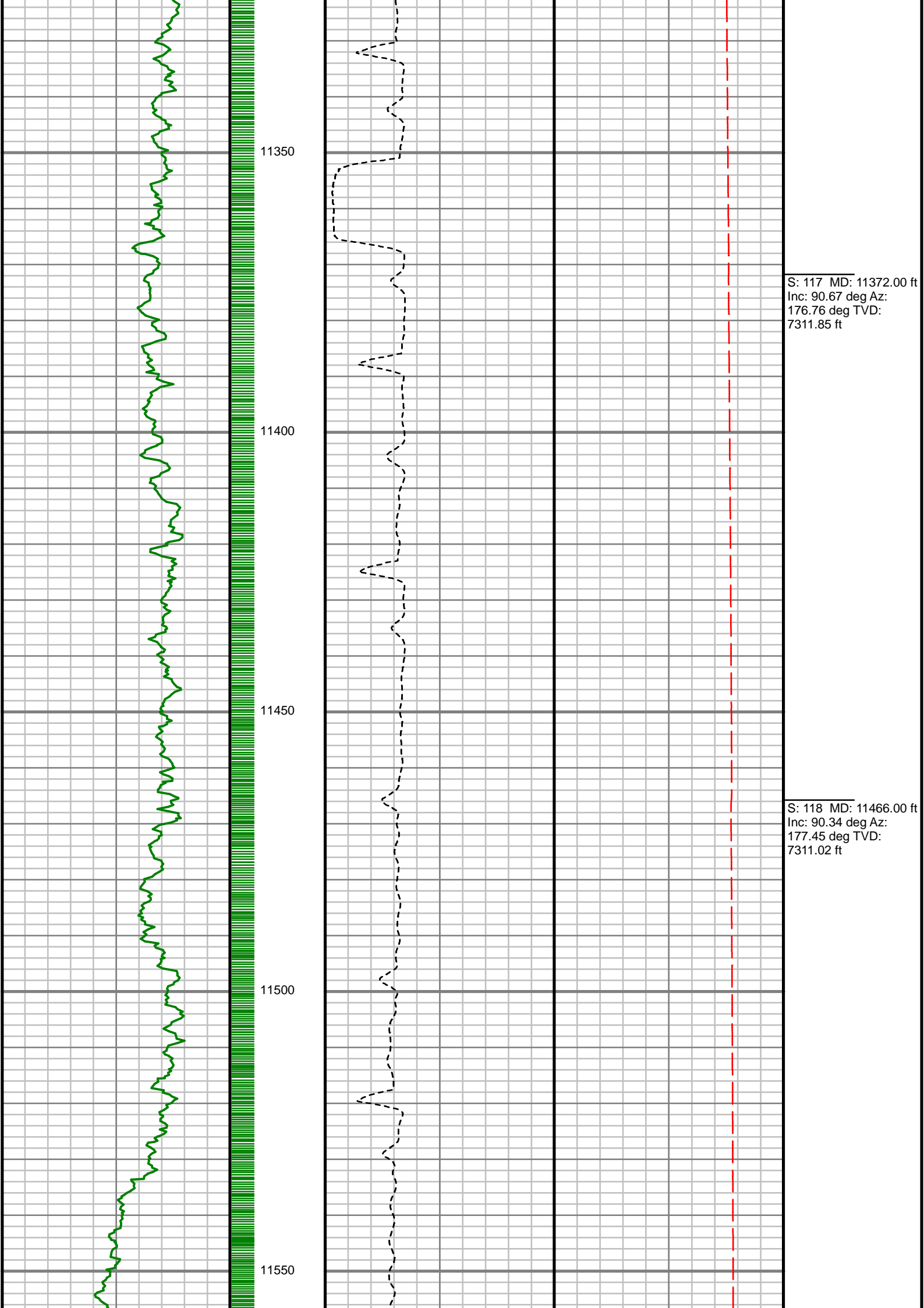


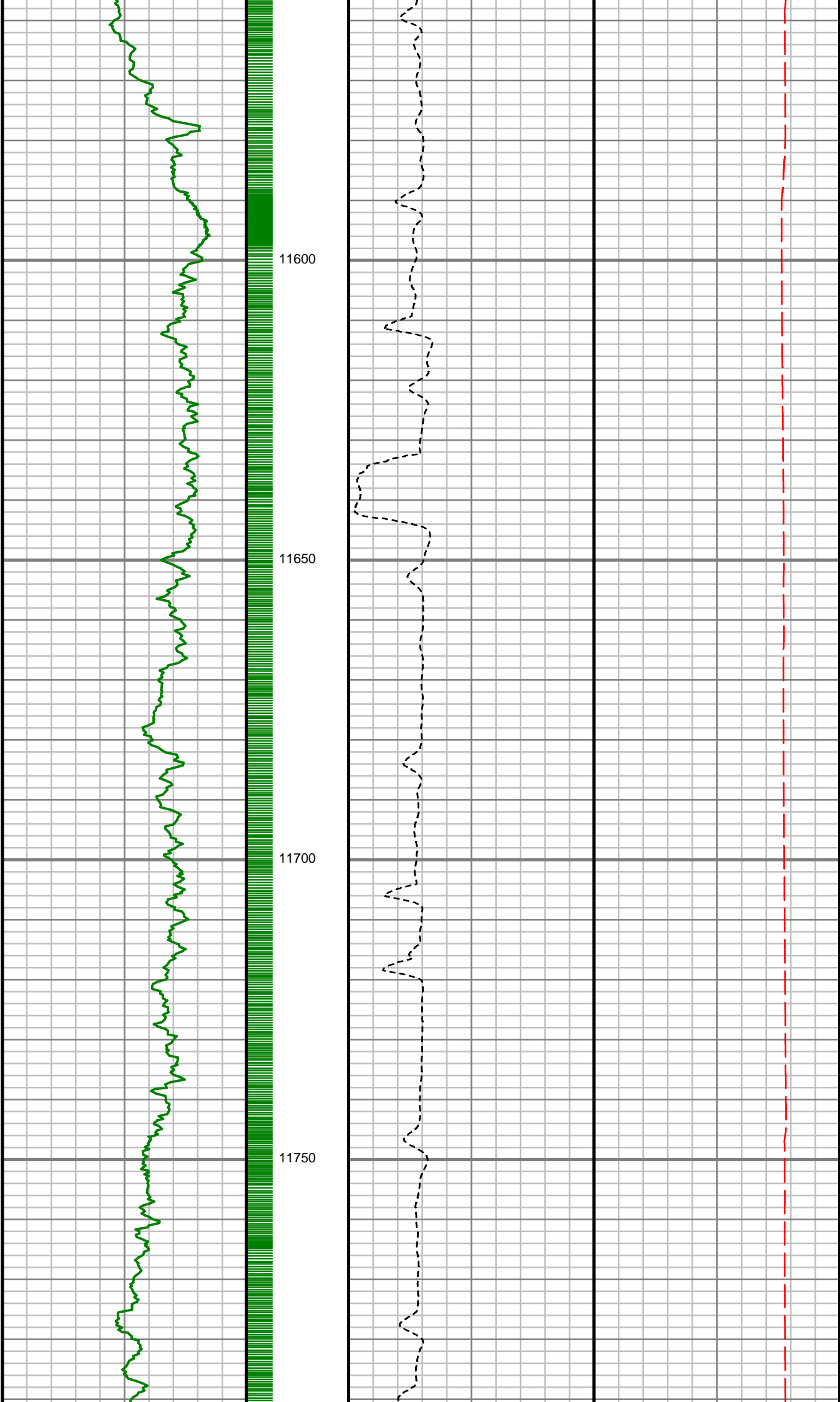


S: 112 MD: 10907.00 ft
Inc: 89.29 deg Az:
178.30 deg TVD:
7307.13 ft

S: 113 MD: 11001.00 ft
Inc: 89.33 deg Az:
179.01 deg TVD:
7308.26 ft



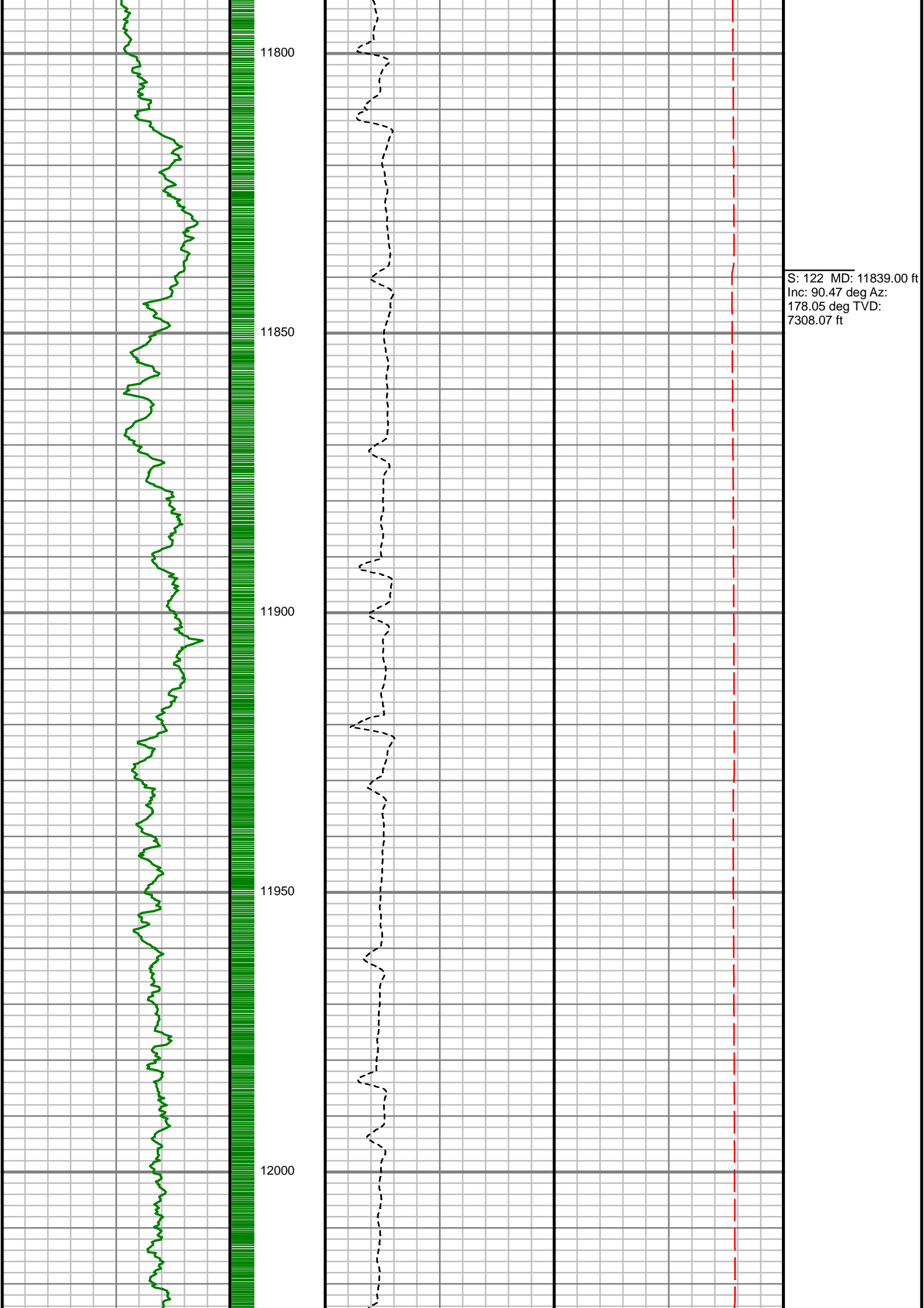


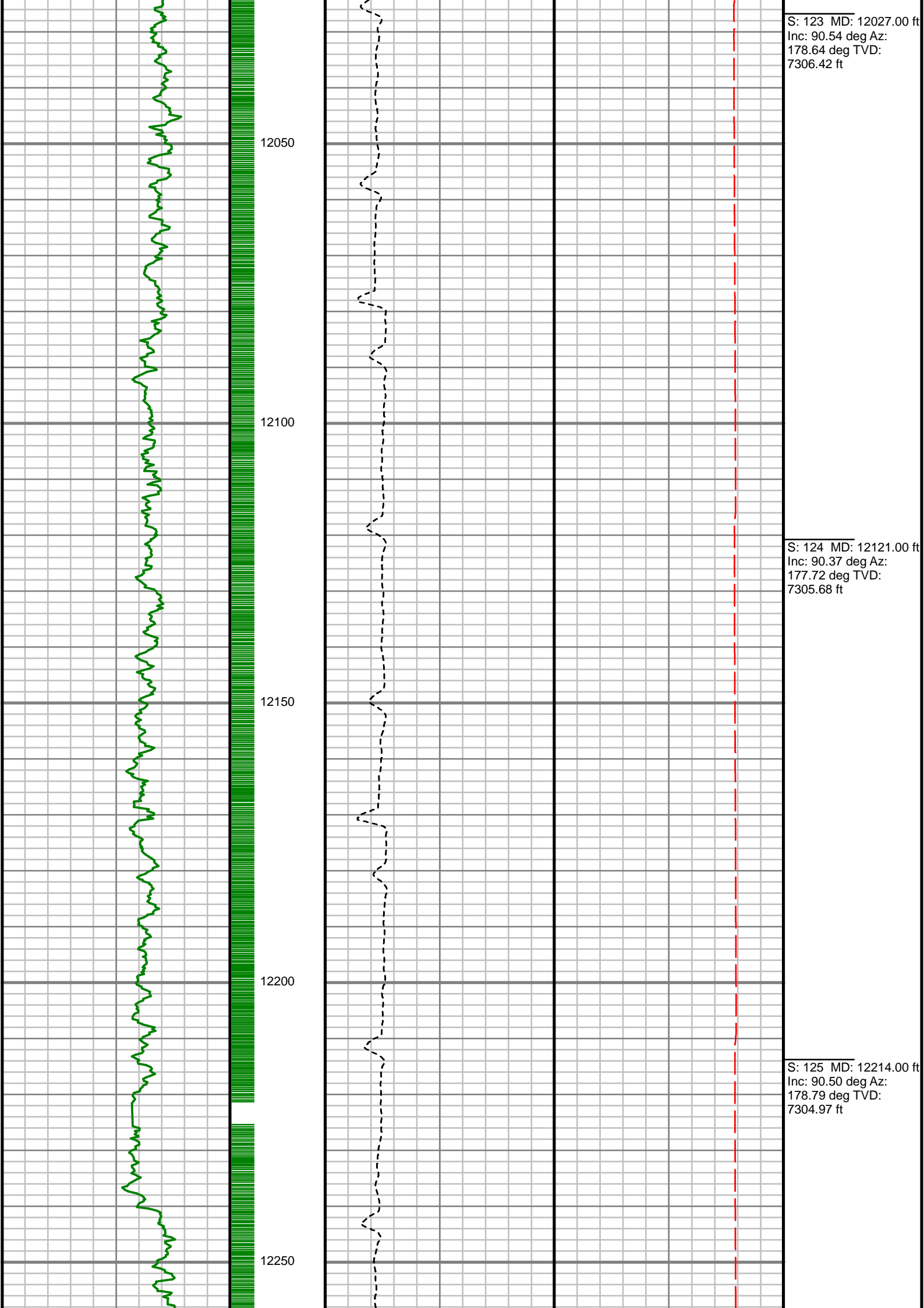


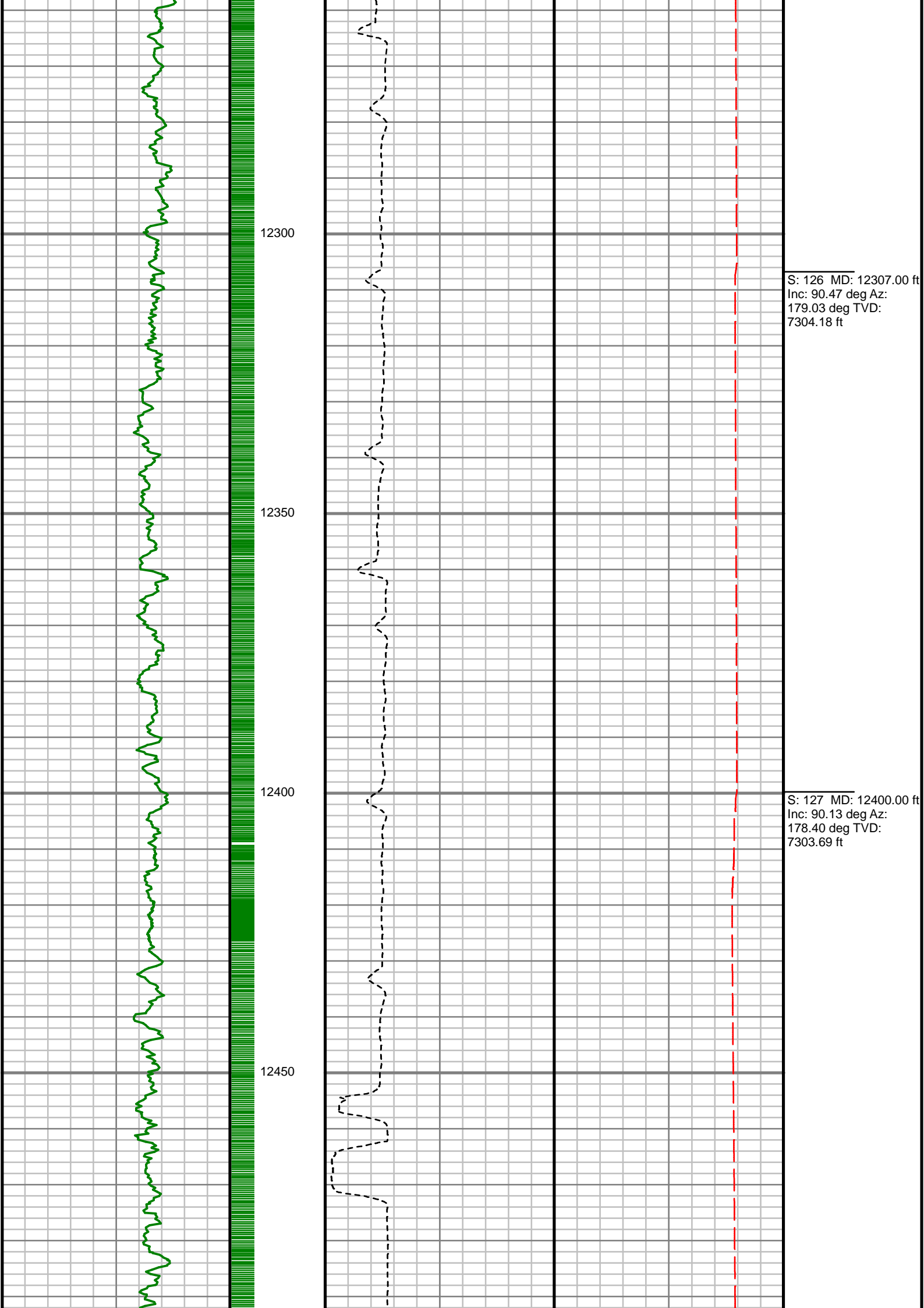
S: 119 MD: 11559.00 ft
Inc: 90.23 deg Az:
176.64 deg TVD:
7310.56 ft

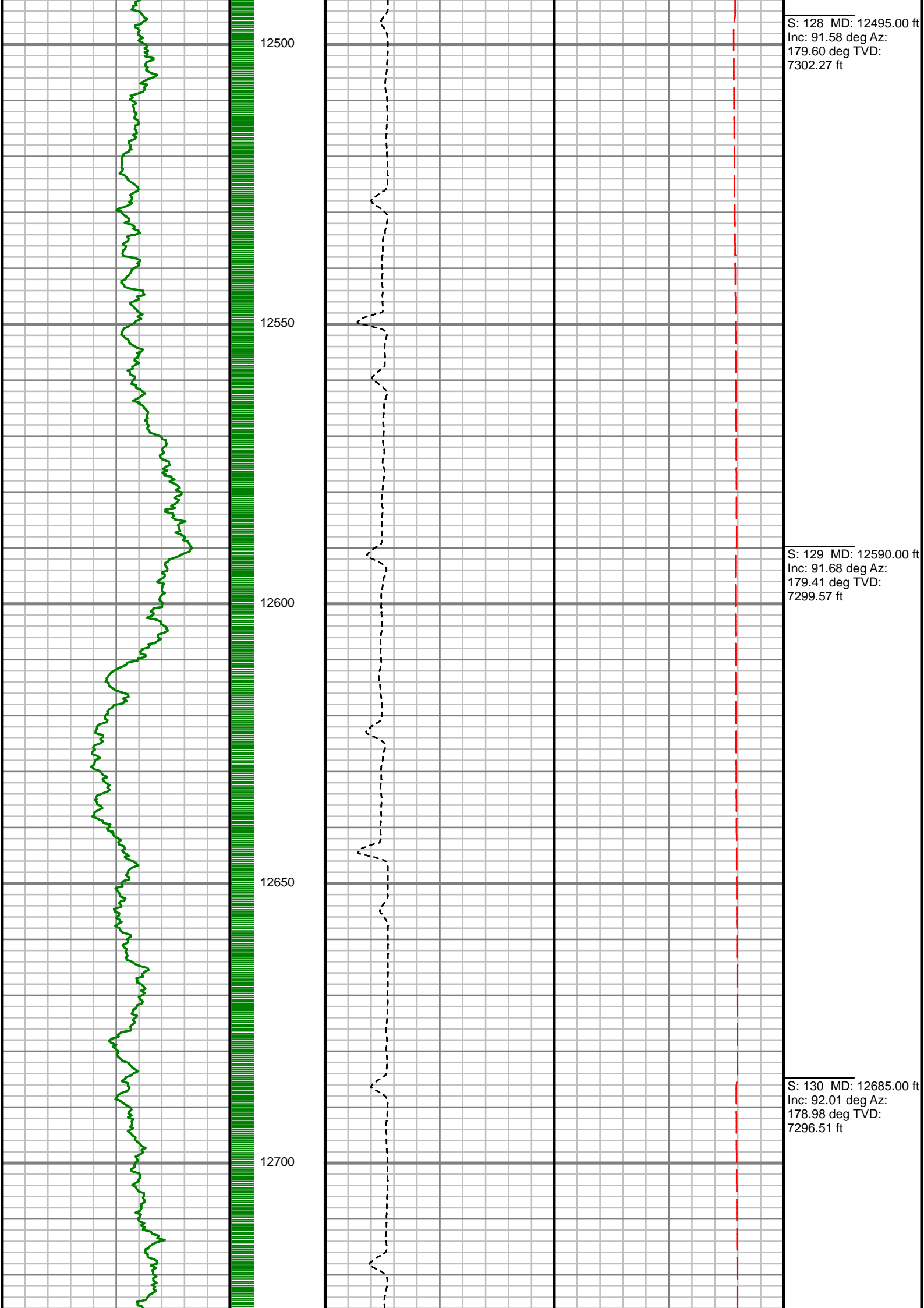
S: 120 MD: 11652.00 ft
Inc: 90.44 deg Az:
177.95 deg TVD:
7310.02 ft

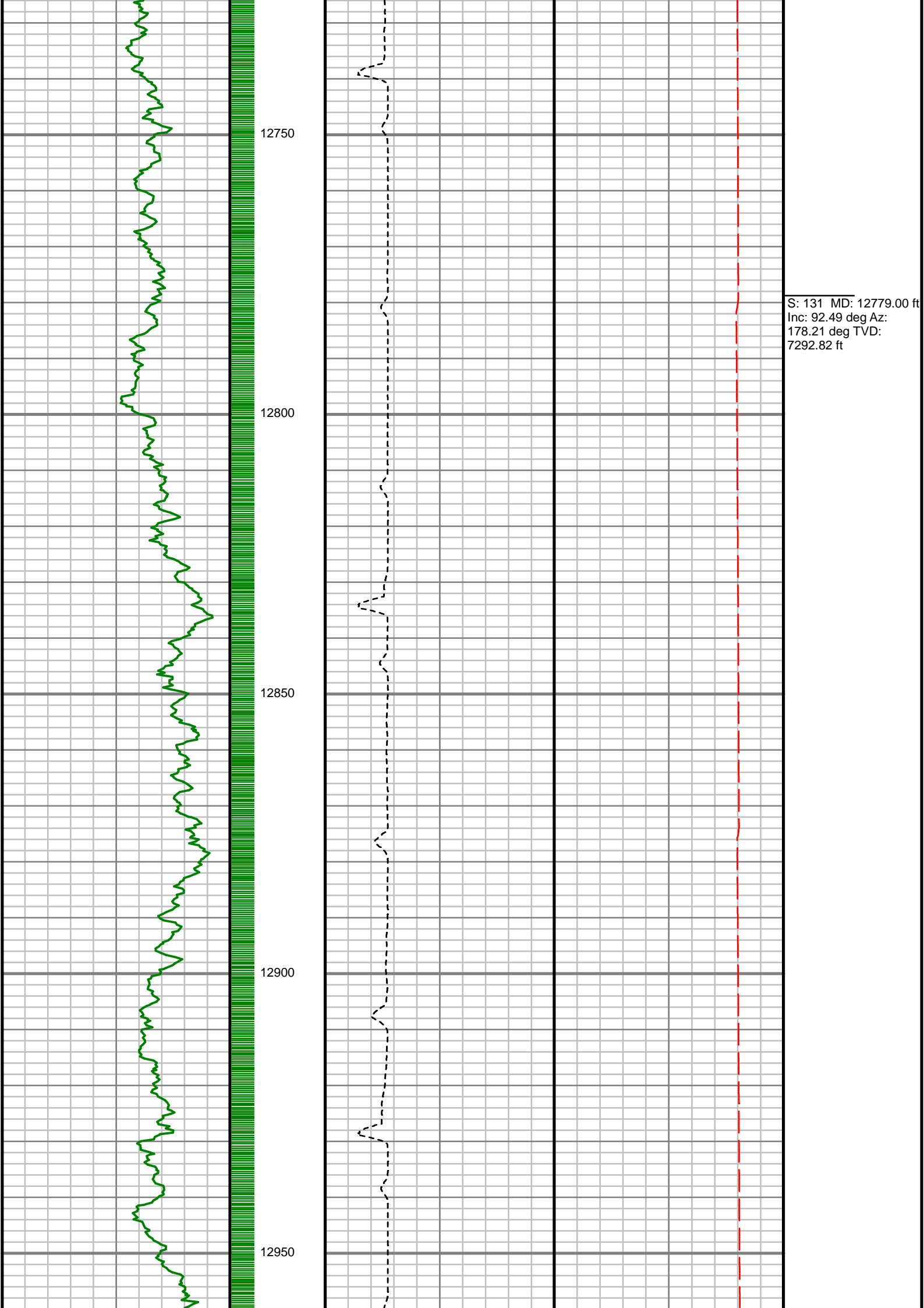
S: 121 MD: 11746.00 ft
Inc: 90.74 deg Az:
177.58 deg TVD:
7309.05 ft

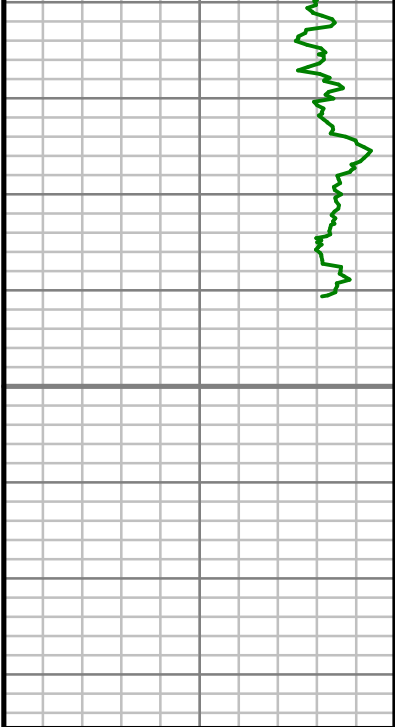








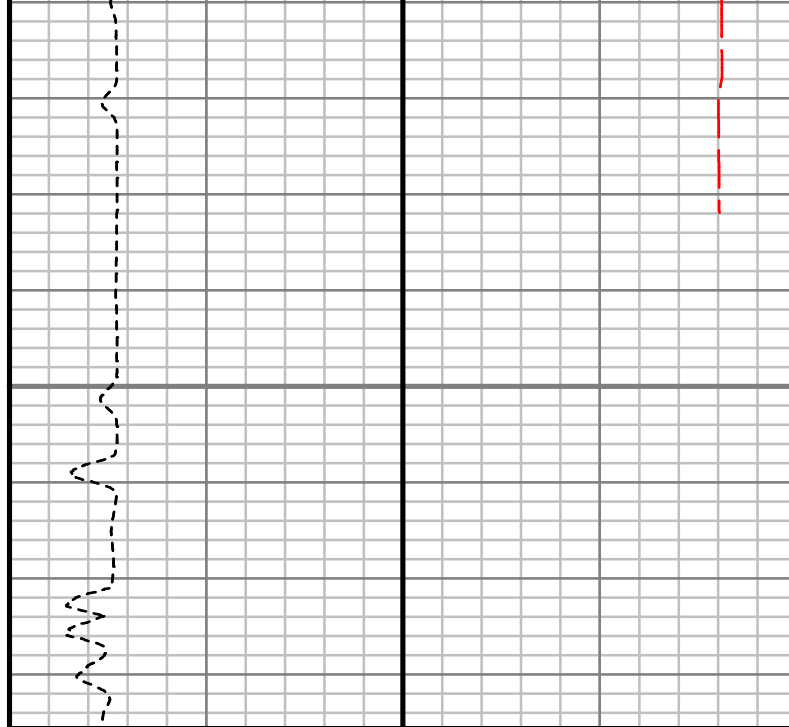




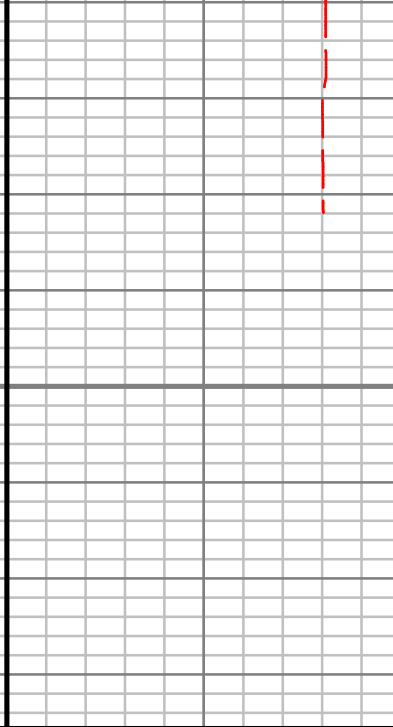
13000

MEASURED DEPTH
1:240 (ft)

Gamma Ray (GR)		
0	Unit = aapi	150



Rate of Penetration (ROP)		
0	Unit = ft/hr	1000



Tool Temperature (T-TEMP)		
0	Unit = °F	300

S: 132 MD: 12967.00 ft
Inc: 92.72 deg Az:
178.44 deg TVD:
7284.28 ft

S: 133 MD: 12980.00 ft
Inc: 92.92 deg Az:
178.34 deg TVD:
7283.64 ft

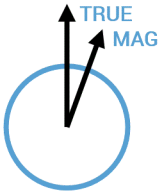
Comments

CUSTOMER ANADARKO E&P ONSHORE LLC.
PROJECT LAND FED
FIELD WATTENBERG

WELL INFORMATION
Lat/Long 40° 5' 56.494" N, 104° 48' 19.292" W
Northing 14,562,852.7 ft
Easting 1,694,847.26 ft
UWI 05123423900000

MAP INFORMATION
North Reference True North
Grid Correction System Universal Transverse Mercator (US Survey Feet)
Datum North American Datum 1983 (GRS 1980)
Map Zone Zone 13N (108 W to 102 W)

VERTICAL SECTION REFERENCE
+N/-S 0 ft
+E/-W 0 ft
Proposal Direction 179.31°
Calculation Method Minimum Curvature



GEOMAGNETIC REFERENCE INFORMATION Local Gravity: 999.046 mG [computed]

MD	MODEL	DATE	DECLINATION	MAG TO TRUE
0-3846 ft	ANADARKO MAGVAR	29 Jun 2016	8.34°	add 8.34°
3846-6017 ft	ANADARKO MAGVAR	29 Jun 2016	8.36°	add 8.36°
6017-9215 ft	ANADARKO MAGVAR	29 Jun 2016	8.37°	add 8.37°
9215-12980 ft	ANADARKO MAGVAR	29 Jun 2016	8.35°	add 8.35°

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
0.00	0.00	0.00	0.00	0.00	0.00	0.00	Invalid
213.00	2.85	34.36	212.91	-4.34	4.37	2.99	1.34
307.00	4.44	31.17	306.72	-9.34	9.41	6.19	1.70
401.00	5.66	27.12	400.35	-16.53	16.65	10.19	1.35
495.00	6.59	27.05	493.82	-25.40	25.58	14.75	0.99
589.00	7.87	25.12	587.07	-35.97	36.22	19.94	1.39
683.00	10.09	14.78	679.91	-49.70	50.01	24.77	2.91
777.00	11.68	9.41	772.22	-67.01	67.36	28.43	2.00
871.00	13.00	5.68	864.05	-86.89	87.27	31.03	1.64
965.00	13.54	3.59	955.54	-108.37	108.77	32.77	0.77
1059.00	14.68	359.89	1046.70	-131.25	131.66	33.43	1.55
1153.00	17.35	0.74	1137.05	-157.18	157.59	33.59	2.85
1247.00	17.63	357.80	1226.70	-185.42	185.83	33.23	0.99
1341.00	16.69	356.04	1316.52	-213.13	213.52	31.75	1.14
1434.00	16.59	356.09	1405.62	-239.71	240.09	29.92	0.11
1528.00	16.83	355.47	1495.66	-266.69	267.05	27.93	0.32
1624.00	16.77	357.97	1587.56	-294.40	294.74	26.34	0.76
1719.00	15.72	357.39	1678.77	-320.97	321.29	25.27	1.12
1814.00	15.66	358.05	1770.23	-346.65	346.97	24.25	0.20
2050.00	14.18	352.73	1998.28	-407.20	407.47	19.51	0.86

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
2145.00	15.78	358.90	2090.05	-431.68	431.93	17.78	2.38
2240.00	14.71	359.79	2181.71	-456.67	456.91	17.49	1.15
2335.00	16.26	357.69	2273.25	-482.03	482.27	16.91	1.74
2430.00	15.12	357.45	2364.71	-507.71	507.94	15.82	1.20
2525.00	16.68	353.77	2456.07	-533.67	533.88	13.79	1.96
2620.00	18.03	354.02	2546.75	-561.89	562.06	10.78	1.42
2714.00	16.16	353.26	2636.59	-589.39	589.52	7.73	2.01
2903.00	13.28	10.27	2819.45	-636.88	637.03	8.51	2.73
2997.00	14.38	8.53	2910.73	-659.00	659.19	12.17	1.25
3092.00	16.03	5.95	3002.40	-683.67	683.91	15.28	1.87
3186.00	14.51	4.10	3093.08	-708.30	708.56	17.47	1.69
3281.00	15.04	2.93	3184.94	-732.46	732.74	18.95	0.64
3376.00	14.25	358.70	3276.85	-756.45	756.74	19.31	1.40
3470.00	15.95	357.09	3367.61	-780.92	781.20	18.39	1.87
3565.00	17.28	358.87	3458.64	-808.07	808.34	17.45	1.49
3657.00	13.74	355.07	3547.28	-832.64	832.89	16.24	4.00
3752.00	14.47	353.79	3639.42	-855.70	855.93	13.99	0.83
3846.00	13.25	352.98	3730.68	-878.09	878.29	11.40	1.31
3941.00	13.47	8.84	3823.14	-899.83	900.03	11.77	3.85
4035.00	13.34	6.99	3914.58	-921.37	921.62	14.77	0.47

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
4130.00	14.05	4.54	4006.88	-943.72	943.99	17.02	0.96
4223.00	14.61	4.98	4096.98	-966.63	966.93	18.93	0.62
4319.00	16.09	2.47	4189.56	-991.97	992.29	20.56	1.69
4414.00	16.35	358.88	4280.78	-1018.49	1018.81	20.86	1.09
4507.00	17.26	2.72	4369.81	-1045.35	1045.68	21.26	1.54
4602.00	13.50	2.26	4461.39	-1070.50	1070.85	22.37	3.96
4697.00	14.26	7.15	4553.62	-1093.17	1093.54	24.26	1.47
4791.00	14.28	2.75	4644.72	-1116.21	1116.60	26.26	1.15
4886.00	14.41	349.87	4736.78	-1139.57	1139.95	24.74	3.35
4979.00	15.29	356.31	4826.68	-1163.23	1163.58	21.92	2.01
5072.00	16.02	359.04	4916.23	-1188.31	1188.65	20.91	1.12
5167.00	16.35	1.53	5007.47	-1214.78	1215.12	21.05	0.81
5261.00	16.05	0.09	5097.73	-1241.00	1241.35	21.42	0.53
5355.00	17.42	358.80	5187.75	-1268.07	1268.41	21.15	1.51
5449.00	17.71	0.34	5277.37	-1296.43	1296.78	20.94	0.58
5542.00	16.14	356.73	5366.34	-1323.49	1323.83	20.28	2.03
5637.00	16.03	0.42	5457.62	-1349.80	1350.14	19.62	1.08
5733.00	16.49	5.21	5549.78	-1376.61	1376.96	20.96	1.48
5828.00	16.92	5.36	5640.78	-1403.77	1404.15	23.47	0.45
5922.00	13.36	3.55	5731.50	-1428.20	1428.61	25.43	3.82

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
6017.00	13.50	0.89	5823.90	-1450.23	1450.65	26.28	0.67
6111.00	12.38	2.26	5915.52	-1471.27	1471.70	26.85	1.23
6205.00	11.89	2.95	6007.41	-1490.99	1491.44	27.74	0.55
6298.00	9.41	2.96	6098.81	-1508.14	1508.60	28.63	2.66
6392.00	7.27	0.82	6191.81	-1521.76	1522.22	29.11	2.30
6484.00	5.33	359.05	6283.25	-1531.86	1532.32	29.12	2.12
6578.00	4.40	353.26	6376.91	-1539.81	1540.27	28.63	1.12
6671.00	2.34	10.21	6469.74	-1545.23	1545.68	28.54	2.44
6765.00	0.40	358.36	6563.71	-1547.44	1547.90	28.88	2.07
6859.00	0.84	21.48	6657.71	-1548.41	1548.88	29.12	0.53
6952.00	5.03	192.42	6750.60	-1545.07	1545.52	28.49	6.31
7046.00	14.04	207.28	6843.22	-1530.95	1531.33	22.36	9.85
7140.00	17.95	198.97	6933.57	-1507.23	1507.49	12.42	4.82
7236.00	23.48	195.08	7023.34	-1474.86	1475.00	2.63	5.93
7331.00	33.33	191.59	7106.80	-1431.03	1431.05	-7.56	10.52
7426.00	40.67	183.82	7182.66	-1374.56	1374.48	-14.88	9.14
7520.00	51.04	180.63	7248.05	-1307.30	1307.18	-17.33	11.30
7615.00	64.46	179.29	7298.63	-1227.14	1227.03	-17.20	14.18
7710.00	77.53	177.71	7329.50	-1137.53	1137.43	-14.81	13.84
7805.00	91.04	176.36	7338.94	-1043.30	1043.25	-9.91	14.29

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
7899.00	90.81	175.54	7337.42	-949.47	949.50	-3.27	0.91
7993.00	90.20	175.51	7336.60	-855.68	855.79	4.06	0.65
8086.00	89.80	176.57	7336.59	-762.84	763.02	10.48	1.22
8180.00	92.56	177.53	7334.66	-668.94	669.17	15.32	3.11
8274.00	91.71	176.88	7331.16	-575.07	575.35	19.90	1.13
8368.00	91.24	177.85	7328.74	-481.15	481.48	24.22	1.15
8463.00	89.30	179.05	7328.29	-386.17	386.52	26.79	2.41
8557.00	88.02	179.23	7330.49	-292.20	292.56	28.19	1.37
8650.00	88.76	179.38	7333.11	-199.24	199.61	29.33	0.81
8744.00	89.76	179.39	7334.32	-105.25	105.62	30.34	1.07
8838.00	90.87	178.51	7333.80	-11.25	11.64	32.06	1.51
8933.00	91.78	179.30	7331.60	83.72	-83.32	33.89	1.27
9028.00	90.20	179.01	7329.96	178.70	-178.29	35.29	1.69
9121.00	90.94	176.98	7329.03	271.66	-271.22	38.54	2.33
9216.00	90.57	176.54	7327.78	366.56	-366.06	43.92	0.60
9310.00	90.77	174.22	7326.68	460.33	-459.74	51.49	2.48
9404.00	91.68	177.15	7324.67	554.11	-553.44	58.56	3.27
9499.00	91.58	177.07	7321.97	649.00	-648.28	63.35	0.13
9593.00	91.91	177.73	7319.10	742.90	-742.14	67.61	0.78
9686.00	91.41	180.12	7316.41	835.85	-835.08	69.35	2.63

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
9780.00	91.85	180.17	7313.73	929.81	-929.04	69.11	0.47
9874.00	89.93	181.18	7312.27	1023.76	-1023.02	68.00	2.30
9968.00	90.13	181.99	7312.22	1117.69	-1116.98	65.40	0.89
10061.00	89.53	182.25	7312.49	1210.57	-1209.92	61.96	0.71
10155.00	90.94	181.44	7312.10	1304.48	-1303.86	58.94	1.73
10249.00	91.08	181.43	7310.45	1398.40	-1397.82	56.58	0.14
10343.00	91.38	181.45	7308.44	1492.31	-1491.77	54.22	0.32
10437.00	91.95	180.71	7305.72	1586.23	-1585.71	52.44	0.99
10530.00	90.03	180.28	7304.11	1679.19	-1678.69	51.64	2.11
10626.00	89.76	180.55	7304.28	1775.17	-1774.69	50.95	0.40
10720.00	89.39	179.77	7304.97	1869.16	-1868.68	50.68	0.91
10814.00	89.33	181.01	7306.02	1963.13	-1962.67	50.04	1.32
10907.00	89.29	178.30	7307.13	2056.12	-2055.65	50.60	2.92
11001.00	89.33	179.01	7308.26	2150.10	-2149.62	52.81	0.76
11093.00	88.49	178.94	7310.02	2242.08	-2241.59	54.45	0.92
11187.00	90.00	177.69	7311.25	2336.06	-2335.54	57.22	2.08
11279.00	89.29	177.20	7311.82	2428.00	-2427.44	61.32	0.94
11372.00	90.67	176.76	7311.85	2520.92	-2520.31	66.22	1.55
11466.00	90.34	177.45	7311.02	2614.85	-2614.19	70.97	0.82
11559.00	90.23	176.64	7310.56	2707.78	-2707.06	75.77	0.88

MD ft	Inc deg	Azim deg	TVD ft	VS ft	+N/-S ft	+E/-W ft	DLS °/100ft
11652.00	90.44	177.95	7310.02	2800.72	-2799.95	80.16	1.42
11746.00	90.74	177.58	7309.05	2894.68	-2893.88	83.82	0.51
11839.00	90.47	178.05	7308.07	2987.64	-2986.80	87.37	0.59
12027.00	90.54	178.64	7306.42	3175.60	-3174.72	92.79	0.31
12121.00	90.37	177.72	7305.68	3269.58	-3268.67	95.79	0.99
12214.00	90.50	178.79	7304.97	3362.56	-3361.62	98.62	1.16
12307.00	90.47	179.03	7304.18	3455.56	-3454.60	100.40	0.26
12400.00	90.13	178.40	7303.69	3548.55	-3547.57	102.48	0.76
12495.00	91.58	179.60	7302.27	3643.53	-3642.54	104.14	1.98
12590.00	91.68	179.41	7299.57	3738.49	-3737.50	104.95	0.23
12685.00	92.01	178.98	7296.51	3833.44	-3832.44	106.29	0.58
12779.00	92.49	178.21	7292.82	3927.36	-3926.34	108.59	0.96
12967.00	92.72	178.44	7284.28	4115.14	-4114.07	114.07	0.17
12980.00	92.92	178.34	7283.64	4128.12	-4127.04	114.44	1.71

5" = 100' FEET MD