

Bit Run Summary

Potassium	%	4.7									
Environmental data											
GR											
Mud weight	ppg	9.7									
Bit size	in	8.5									
Resistivity											
Neutron porosity											
Hole Size	in	8.5									
Mud weight	ppg	9.7									
Temperature	°C	85.0									
Mud salinity	ppk	85.0									
Formation salinity											
Recording rate ADN/GVR	SEC	5									
Recording rate SONIC	SEC	10									
Filtering GR		3pt									
Filtering density		3pt									
Filtering Neutron		3pt									
Company representative		G.Cambell	B.Bigby								
Schlumberger D&M Personnel		R.Borjas	C.Skiba	A.Kohli	C.Cocks	M.Blackner					

OTHER SERVICES FOR RUN1 Directional Drilling Directional Surveys Annulus Pressure & Temperature Ultrasonic Caliper	OTHER SERVICES FOR RUN	OTHER SERVICES FOR RUN
<p>REMARKS: RUN NUMBER 1 Depth is referenced to Driller's Depth .</p> <p>Gamma Ray is corrected for mud weight, tool size, bit size and potassium content.</p> <p>Resistivity is borehole compensated and environmentally corrected.</p> <p>Thermal Neutron Porosity is corrected for the effects of bit size, temperature, mud salinity, and mud hydrogen index (a factor of mud weight, mud temperature and pressure.</p> <p>Neutron porosity is calculated using a limestone matrix density of 2.71 g/cm3.</p> <p>Delta-T is borehole compensated.</p> <p>POOH at TD of HLA A16A</p>	<p>REMARKS: RUN NUMBER</p>	<p>REMARKS: RUN NUMBER</p>

DOWNHOLE EQUIPMENT

6-3/4 in. adnVISION*

DHS: V8.3

BladeOD: 8-1/4 in.

S/N: AD09

Neutron F

Neutron N

Density S

Density L

UltraSoni

R-O Port

35.06

34.91

34.04

33.94

33.56

32.80

37.04

6-3/4 in. sonicVISION*

DHS: 6.6

S/N: 607

RX array

R-O port

Xmitter

27.43

27.03

23.99

30.78

6-5/8 in. ILS

BladeOD: 8-3/8 in.

S/N: 0SS0551299F

23.19

6-7/8 in. PowerPulse*

MDC: V875

MEC: 1281

MDI: 1751

MGR: AA-146

DHS: 8.0C03

D&I

GR

APWD

Shallow

Medium

18.06

17.41

14.81

12.45

12.33

22.32

6-3/4 in. GeoVISION*

DHS: 6.2B01

Blade OD: 8-1/8 in.

S/N: 41380

Deep

Ring Res

R-O port

GR

12.15

11.98

11.84

11.62

13.93

7 in. PowePak* Motor

A700GT 7:8

S/N: N7311

1.50 deg. Bent Housing

Bit Res

5.55

10.28

8-1/2 in. PDC Bit

S73HPX

JT8946 A

0.00

0.22

Maximum string diameter 8.50 in.
All lengths in Metres

Variable Name	Variable Description	Run Name & Value
Run Number		1
General Information		
BHT_RM	Bottom Hole Temperature (RM)	85.000000
BSAL_RM	Mud Salinity (RM)	85.000000
BS_RM	Bit Size (RM)	8.500000
COEF_M	User Defined FEXP in Clean Sand	1.650000
C_WS	Overpressure correction to Sw and M	1.000000
FEXP	Formation Factor Exponent(RM)	2.000000
FNUM	Formation Factor Enumerator(RM)	1.000000
FPHI_RM	Formation Factor Porosity Source (RM)	XPLOT
MST_RM	Mud Sample temperature (RM)	21.800000
MW_RM	Mud Weight (RM)	9.700000
OBMF_RM	Oil Based Mud (RM)	NO
RHOF_RM	Mud Filtrate Density (RM)	1.000000
RHOM_RM	Matrix density (RM)	2.710000
RMS_RM	Resistivity of Mud Sample (RM)	0.097100
RWA_COMP_M	Rwa computation model	BASIC
RWA_DEN_AD	Rwa Density Input ADN	RHOB
RWA_DEN_CD	Rwa Density Input CDN	RHOB
RWA_DEN_IN	Rwa Density Input	RHOB
RWA_FORM_M	Rwa computation formation model	CLASTIC
RWA_RES_IN	Rwa computation resistivity input	RAB_RING
RWS_RM	Resistivity of Connate Water (RM)	1.000000
SHT_RM	Surface Hole Temperature (RM)	25.000000
TD_RM	Total Measured Depth (RM)	2568.000000
TWS_RM	Temperature of Connate Water (RM)	75.000000
VF_ILLI	Fraction of illite in shales	0.500000
VF_KAOL	Fraction of kaolinite in shales	0.500000
VF_MONT	Fraction of montmorillonite in shales	0.000000
XPDM_RM	Cross plot density porosity multiplier	0.675000
XPNM_RM	Cross plot neutron porosity multiplier	0.325000
ADN		
LWD_RM/STATION_FILE/PARAMETER	Station Time-frame file name	Station
ADN_CHASSI	ADN Chassis Type String	ADN
ADN_COLLAR	ADN Collar Type String	ADN
ADN_STAB_S	ADN Stabilizer Type String	ADN
ALPHA_COMP	Perform Density Enhanced Vertical Resolution process ?	NO
ALPHA_COMP	Perform Neutron Enhanced Vertical Resolution process ?	NO
AVE ADN	ADN/Array Channels: perform averaging(RM) :	YES
A_DHS	ADN Down Hole Software Version String	YES
CHI_RM	Caliper High limit from BS (RM)	3.000000
CLO_RM	Caliper Low limit from BS (RM)	0.000000
DEVI	Well Section Deviation	15.890000
DTIK_SEL	ADN: Density Tick Channel Name	LSAZ
DTMUD	Delta-T for Mud	187.889999
DYN_IMG_CO	Generate Dynamic Normalized Image?	YES
ECC_CORR_A	Perform Eccentering Correction for TNPH?	YES
ENVCOR	Neutron Quadrant Processing: Environmental Correction?	YES
EVRL	EVR Process averaging number of samples (RM)	49
FCD	Future Casing (Outer) Diameter	7.000000
GCSE	Generalized Caliper Selection	BS
HPS	ADSE-EB (High Pressure Inconel Chassis)?	NO
IBS	Intergal Blade Stabilizer Collar?	YES
IDQT	Image Derived Quality Threshold	1.000000
IHVS	Integrated Hole Volume Start Value(RM)	0.000000
IMAGE_MAX_	Image SOA (Quadrant) Right Scale	2.500000
IMAGE_MAX_	Image PEF(Segment) Right Scale	6.000000
IMAGE_MAX_	Image RHOB(Segment) Right Scale	2.650000
IMAGE_MIN_	Image SOA (Quadrant) Left Scale	0.000000
IMAGE_MIN_	Image PEF(Segment) Left Scale	2.000000
IMAGE_MIN_	Image RHOB(Segment) Left Scale	2.050000
JSD ADN	ADN Acquisition start date	2.050000
LITHO_TYPE	Lithology (RM)	LIME
N1FTU_6_RM	ADN: Neutron Bank 1 Far Tubes used :	1-2-3
N2FTU_6_RM	ADN: Neutron Bank 2 Far Tubes used :	1-2-3
NNTU_RM	ADN Neutron Near Banks Used	1-2
NTIK_SEL	ADN: Neutron Tick Channel Name	FR11
SHT_RM	Ground Level Temperature (Mud-Line When Offshore) (RM)	25.000000
SOCNL	Standoff Distance of the CNL Tool	1.000000
SSIZ ADN	ADN Stabilizer Size	8.250000
STOH_	ADN Density Top of Hole Sector (Left Boundary):	SECTOR_0
TRPM_RM	Average Tool Rotational Speed	20.000000
USMIN_RM	ADN:Minimum Ultrasonic standoff (RM)	0.180000
USWF_RM	ADN:Process Ultrasonic Waveform?	YES
VERS_ADN	ADN Downhole Software Version	8.300000
WSDI_	Window Size of Dynamic Normalization Image	15.000000
RAB		
RAB/BTN_SLV_SIZE/PARAMETER	RAB: Button Sleeve Diameter	RAB6:
RAB/STAB_SIZE/PARAMETER	RAB: Stabilizer Diameter	RAB6:
BDBHCA	RAB: Button Deep Borehole A Factor	0.003555
BDBHCB	RAB: Button Deep Borehole B Factor	0.000000
BHA_COEF_V	RAB: BHA Coef Generator Version	2.000000
BITBHCA	RAB: Bit A Borehole Factor	0.057576
BITBHCB	RAB: Bit B Borehole Factor	0.000000
BIT_K_FACT	RAB: Bit K Factor	14.555807
BMBHCA	RAB: Button Medium Borehole A Factor	0.022478
BMBHCB	RAB: Button Medium Borehole B Factor	0.000000

BSSHCA	RAB: Button Shallow Borehole A Factor	0.021991
BSBHCB	RAB: Button Shallow Borehole B Factor	0.000000
BUT_KIMP_A	RAB: Button Impedance Coeff A	0.000000
BUT_KIMP_B	RAB: Button Impedance Coeff B	0.000000
DBUTTON_K	RAB: Button Deep K factor	0.004594
GR_BHC_TOO	RAB: Gamma-Ray Borehole Coeff 1	6.750000
HI_CSDEPTH	RAB: Allow Hi-Resolution CS DEPTH Image Data Output	YES
HI_DLIS_OU	RAB: Allow Hi-Resolution DLIS Image Data Output	YES
HI_RIVER_O	RAB: Allow Hi-Resolution River for Image Data Output	YES
IMAGE_MAX_	RAB: GR Image Maximum Scale Value	120.000000
IMAGE_MAX_	RAB: Image Maximum Resistivity Value	100.000000
IMAGE_MIN_	RAB: GR Image Minimum Scale Value	20.000000
IMAGE_MIN_	RAB: Image Minimum Resistivity Value	1.000000
JSD_RAB	RAB Acquisition start date	1.000000
KPER	Potassium Concentration (RM)	4.420000
MAG_DECL_R	RAB: Magnetic Declination	13.229998
MAG_INCL_R	RAB: Magnetic Dip	-68.859993
MBUTTON_K_	RAB: Button Medium K Factor	0.005263
OBM	RAB: Oil base Mud	NO
ORIENTATIO	Rab Image Orientation	TOH
RABBDA0	RAB: Button Deep A0 Coeff	-0.049596
RABBDA1	RAB: Button Deep A1 Coeff	0.019506
RABBDA2	RAB: Button Deep A2 Coeff	-0.004362
RABBDA3	RAB: Button Deep A3 Coeff	0.000455
RABBDA4	RAB: Button Deep A4 Coeff	-0.000017
RABBDA5	RAB: Button Deep A5 Coeff	0.000000
RABBDMIN	RAB: Button Deep Minimum Value	0.051084
RABBITA0	RAB: Bit A0 Coeff	3.854710
RABBITA1	RAB: Bit A1 Coeff	-4.215647
RABBITA2	RAB: Bit A2 Coeff	11.379987
RABBITA3	RAB: Bit A3 Coeff	-11.876939
RABBITA4	RAB: Bit A4 Coeff	4.796395
RABBITA5	RAB: Bit A5 Coeff	0.000000
RABBITMIN	RAB: Bit Minimum Value	21.114967
RABBMA0	RAB: Button Medium A0 Coeff	-0.059916
RABBMA1	RAB: Button Medium A1 Coeff	0.025609
RABBMA2	RAB: Button Medium A2 Coeff	-0.005951
RABBMA3	RAB: Button Medium A3 Coeff	0.000628
RABBMA4	RAB: Button Medium A4 Coeff	-0.000024
RABBMA5	RAB: Button Medium A5 Coeff	0.000000
RABBMMIN	RAB: Button Medium Minimum Value	0.059503
RABBSA0	RAB: Button Shallow A0 Coeff	-0.071702
RABBSA1	RAB: Button Shallow A1 Coeff	0.030312
RABBSA2	RAB: Button Shallow A2 Coeff	-0.006846
RABBSA3	RAB: Button Shallow A3 Coeff	0.000699
RABBSA4	RAB: Button Shallow A4 Coeff	-0.000026
RABBSA5	RAB: Button Shallow A5 Coeff	0.000000
RABBSMIN	RAB: Button Shallow Minimum Value	0.086483
RABDHS	RAB Down Hole Software	4.000000
RABEC	RAB: Resistivity Env-Cor	YES
RABRNGA0	RAB: RING A0 Coeff	-0.045486
RABRNGA1	RAB: RING A1 Coeff	0.017751
RABRNGA2	RAB: RING A2 Coeff	-0.004021
RABRNGA3	RAB: RING A3 Coeff	0.000427
RABRNGA4	RAB: RING A4 Coeff	-0.000016
RABRNGA5	RAB: RING A5 Coeff	0.000000
RABRNGMIN	RAB: Ring Minimum Value	1.696959
RAB_BIT_EC	Bit Resistivity for ECAL RAB?	YES
RAB_BIT_IN	Input Bit Resistivity for Inversion? (Recommended at the bit)	NO
RAB_CALIPE	Compute ECAL RAB?	YES
RAB_DEEPBT	Deep Button Resistivity for ECAL RAB?	YES
RAB_DEEPBT	Input Deep Button Resistivity for Inversion?	YES
RAB_INVERS	Perform Rt Inversion?	YES
RAB_INVERS	RAB Bit Sensor Weight for Inversion[0,1]	0.000000
RAB_INVERS	Ending Depth for GR Cutoff in Zone1	100000.000000
RAB_INVERS	Continuity Multiplier[0,1]	0.500000
RAB_INVERS	RAB Deep Button Sensor Weight for Inversion[0,1]	1.000000
RAB_INVERS	RAB inversion for Dh?	NO
RAB_INVERS	RAB inversion for Di?	YES
RAB_INVERS	GR Cutoff for Shale Formation	75.000000
RAB_INVERS	GR Cutoff for Shale Formation in Zone1	75.000000
RAB_INVERS	GR Cutoff in Zone10	75.000000
RAB_INVERS	GR Cutoff in Zone2	75.000000
RAB_INVERS	GR Cutoff in Zone3	75.000000
RAB_INVERS	GR Cutoff in Zone4	75.000000
RAB_INVERS	GR Cutoff in Zone5	75.000000
RAB_INVERS	GR Cutoff in Zone6	75.000000
RAB_INVERS	GR Cutoff in Zone7	75.000000
RAB_INVERS	GR Cutoff in Zone8	75.000000
RAB_INVERS	GR Cutoff in Zone9	75.000000
RAB_INVERS	RAB Medium Button Sensor Weight for Inversion[0,1]	1.000000
RAB_INVERS	Resistivity Cutoff for Shale Formation	2.000000
RAB_INVERS	Resistive Invasion Allowed	NO
RAB_INVERS	RAB Ring Sensor Weight for Inversion[0,1]	0.000000
RAB_INVERS	RAB inversion for Rmud?	NO
RAB_INVERS	RAB inversion for Rt?	YES
RAB_INVERS	Rt to R-deepest separation penalty multiplier[0,1]	0.500000
RAB_INVERS	RAB inversion for Rxo?	YES
RAB_INVERS	RAB Shallow Button Sensor Weight for Inversion[0,1]	1.000000
RAB_INVERS	Inversion Threshold[0, 0.3]	0.010000
RAB_INVERS	Formation Water Resistivity	0.100000
RAB_INVERS	Formation Water Temperature	150.000000
RAB_MEDIUM	Medium Button Resistivity for ECAL_RAB?	YES
RAB_MEDIUM	Input Medium Button Resistivity for Inversion?	YES
RAB_QUAD	RAB: Process Quadrant data ?	YES
RAB_BITMAP	Bit on Bottom?	YES

RAB_RIGMOD	Bit On Bottom?	YES
RAB_RING_E	Ring Resistivity for ECAL_RAB?	YES
RAB_RING_I	Input RING Resistivity for Inversion?	NO
RAB_SHALLO	Shallow Button Resistivity for ECAL_RAB?	YES
RAB_SHALLO	Input Shallow Button Resistivity for Inversion?	YES
RAB_TAB	RAB: Compute TAB ?	YES
RAB_TECHLO	RAB: Generate Techlog ?	YES
RAB_TEMP_S	RAB Temperature Selection	MEASURED
RAB_TICKS	RAB: Generate Ticks ?	YES
READOUT_PO	RAB: ROP to Bit Face Distance	38.845112
RINGBHCA	RAB: Ring Borehole A Factor	0.159092
RINGBHCB	RAB: Ring Borehole B Factor	0.000000
RING_KIMP	RAB: Ring Impedance Coeff A	0.000000
RING_KIMP	RAB: Ring Impedance Coeff B	0.000000
RING_K_FAC	RAB: Ring K Factor	0.153555
SBUTTON_K	RAB: Button Shallow K Factor	0.007135
SCALE_IMAG	RAB: Process Image Data	YES
STAB	RAB: Run with Stabilizer	YES
TFF_OFFSET	RAB Time-Frame File Time Offset	0.000000
TIMEFRAME	RAB: Time Frame File Name	0.000000
TOOLTYPE	RAB: Azimuthal Tool	YES
VRAB6	Rab Tool type (ENP/PILOT)	RAB6_C_SERIES
WIN_SIZE_D	RAB: Window Size for Scaling Dynamic Image	3.000000
WRK	Way to Report Potassium Concentration (RM)	K_by_Wgt_%

ISONIC

FP_SD	First Sample delay	400.00
STC_CF	Center frequency of Filter	13.00
STC_BW	Bandwidth (kHz)	5.00 kHz
STC_RWI	Receiver waveform ignored	None
PM_TOFF	Tool Time offset from surface system	0.00
DT_COH	Delta-T Coherence Cutoff Value	0.70
PPC_PF	Porosity Formula	Raymer-Hunt
PPC_PS	Sonic Porosity Source	DTRA
PPC_MDT	Matrix Delta-T	55.50
PPC_FDT	Fluid Delta-T	189.00

Schlumberger Drilling & Measurements

Parameter Insert Header

IDEAL Version: ID12_0C_01

IDF

Format: GeoVISION Density Neutron Log

Vertical Scale: 1:500

Graphics File Created: 16-Mar-2007 13:34

PIP SUMMARY

Neutron Samples

Density Samples

Rate of Penetration, Averaged over Last
5ft (ROP5_RM)

200 (M/HR) 0

RAB Gamma Ray (GR_RAB)

0 (GAPI) 200

Vertical Hole Diameter (VERD)

6 (IN) 16

Horizontal Hole Diameter (HORD)

6 (IN) 16

Thermal Neutron Porosity (TNPH)

45 (PU) -15

Bulk Density, Bottom (ROBB)

1.85 (G/C3) 2.85

Density Time After Bit (TAB_DEN)

0 (HR) 10

ADN
Rotational
Speed
(RPM_ADN)
(RPM)

0 250

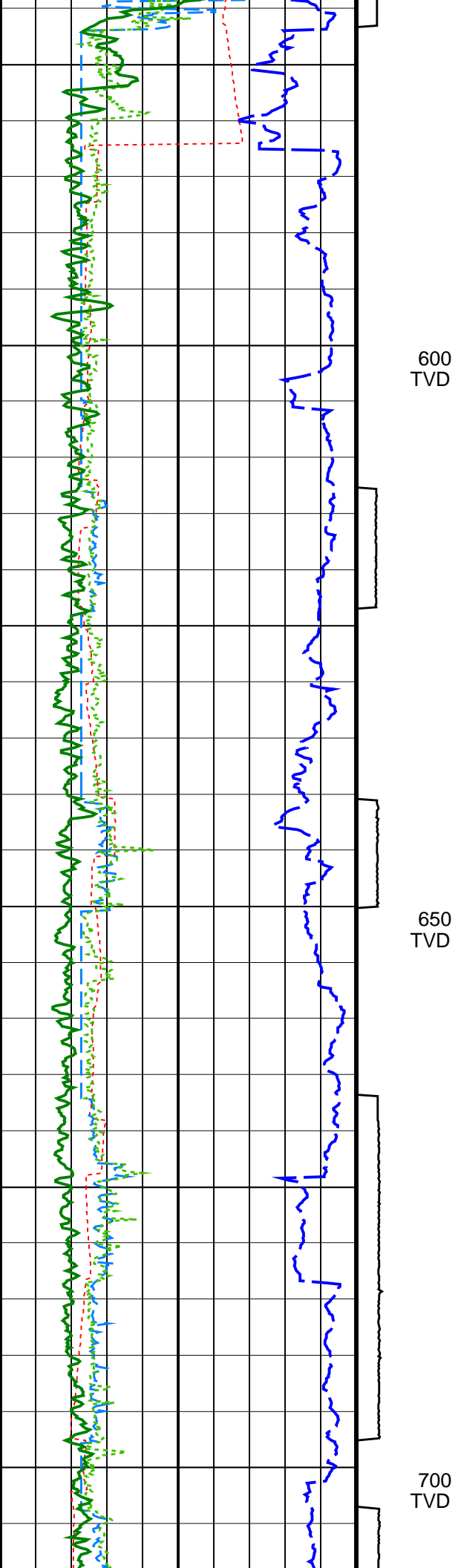
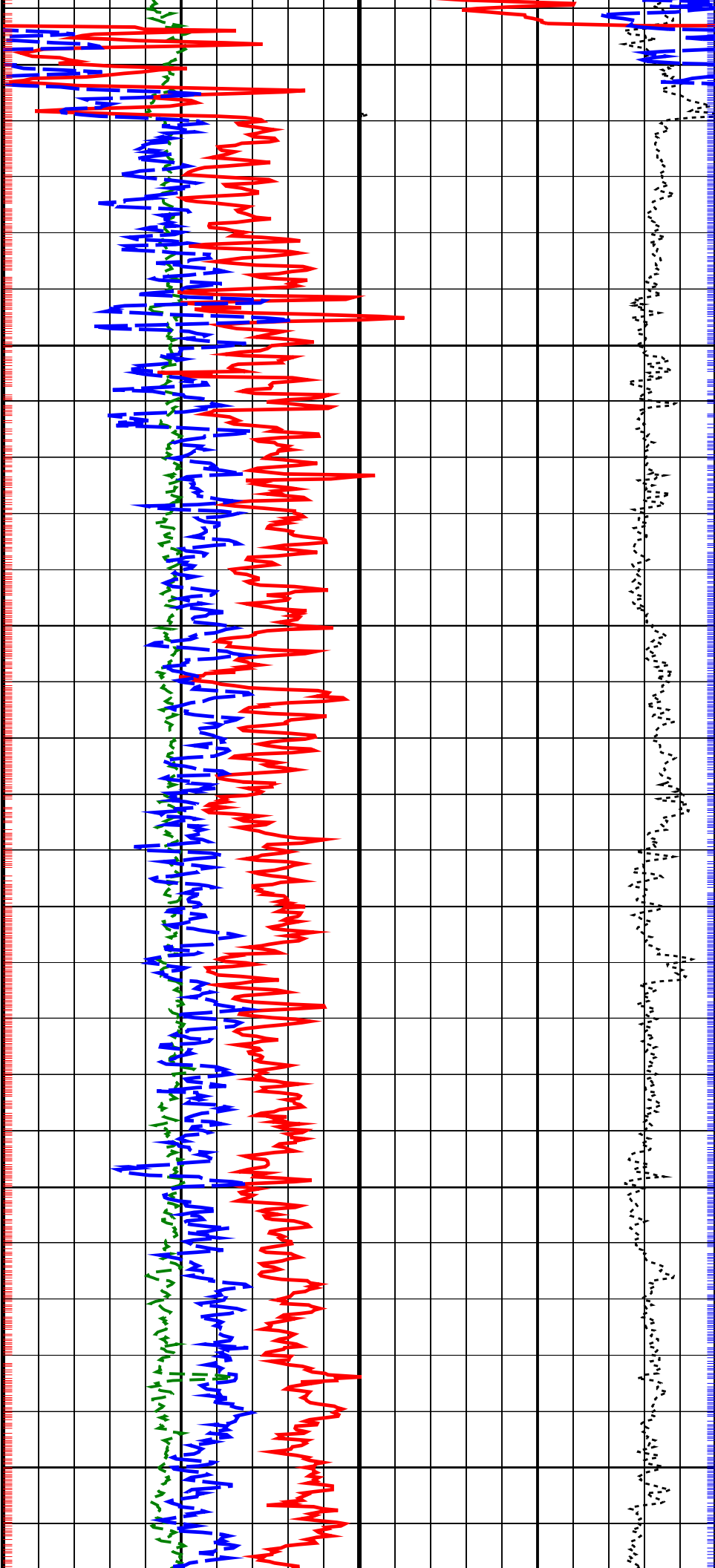
Photoelectric Factor, Bottom (PEB)

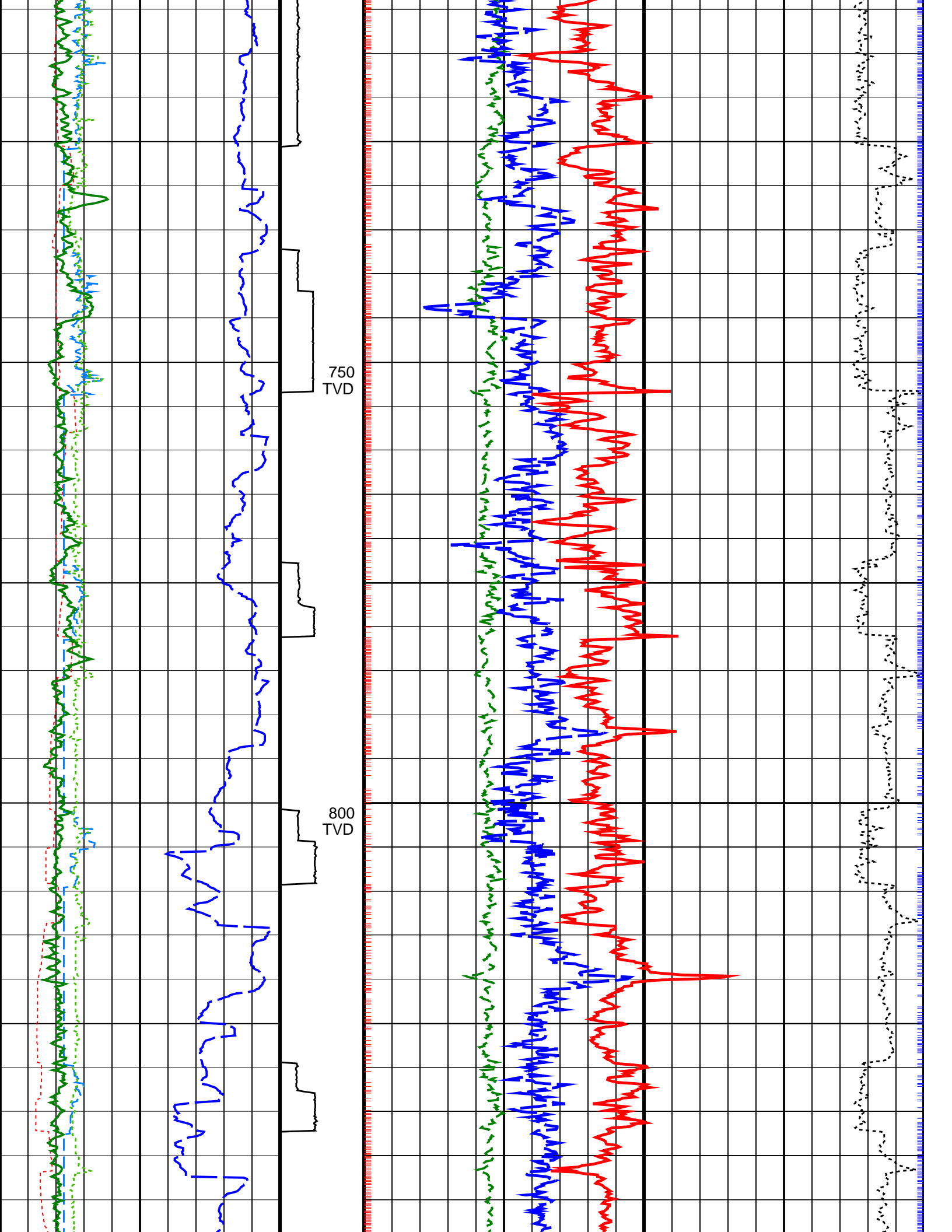
0 (----) 10

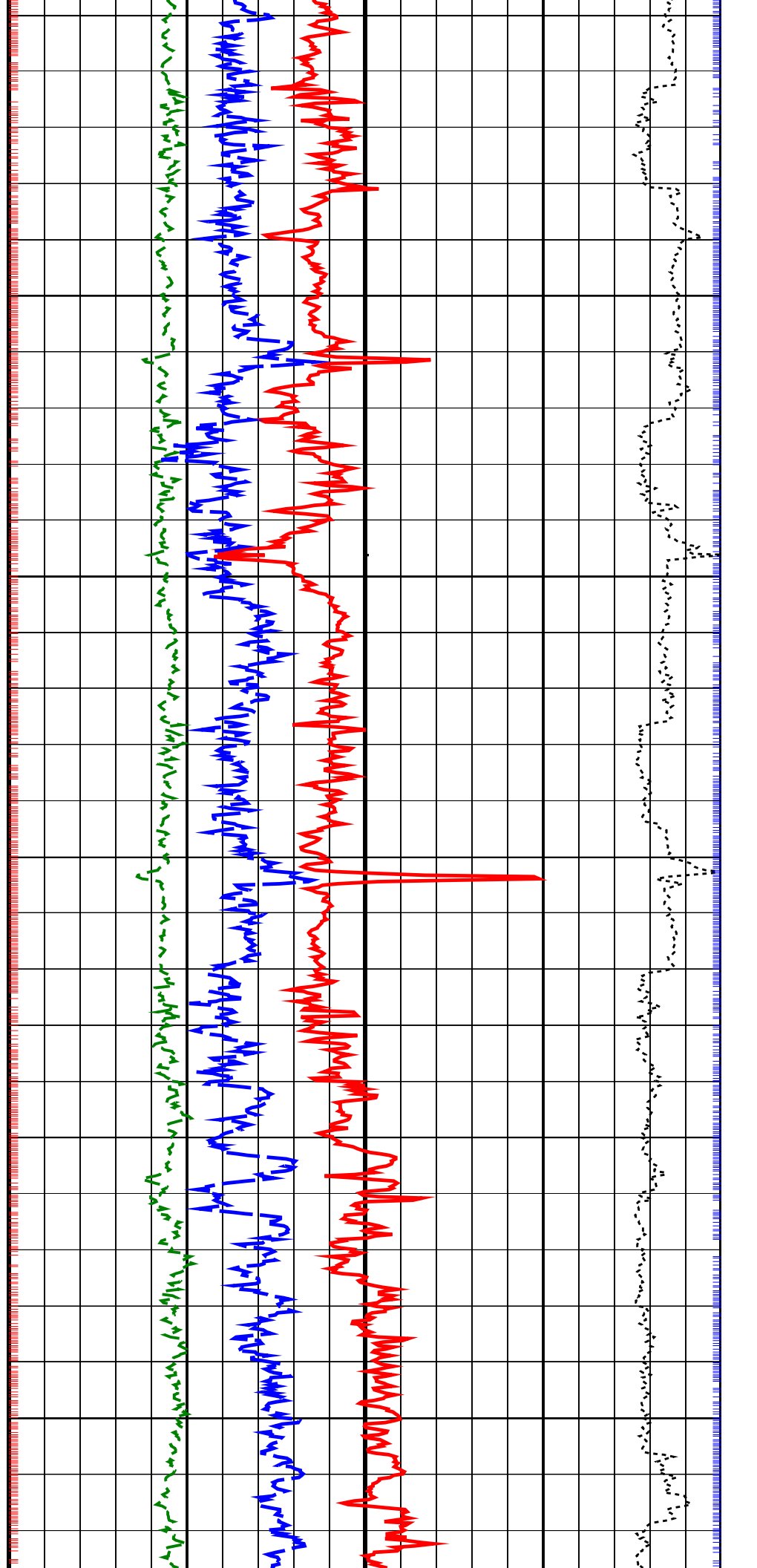
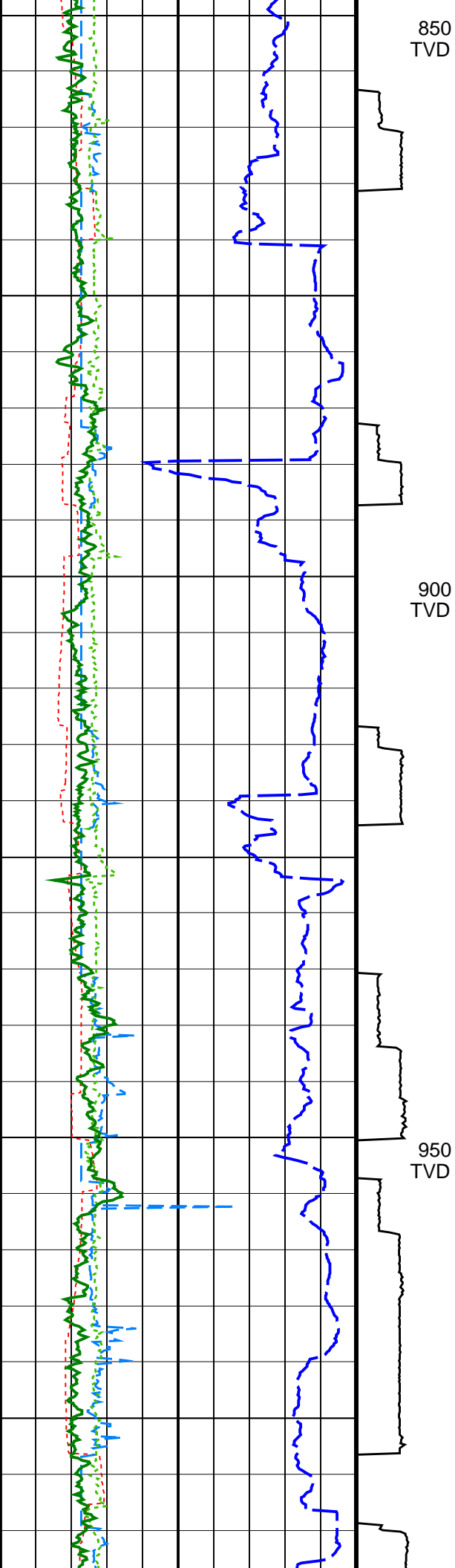
Bulk Density Correction, Bottom

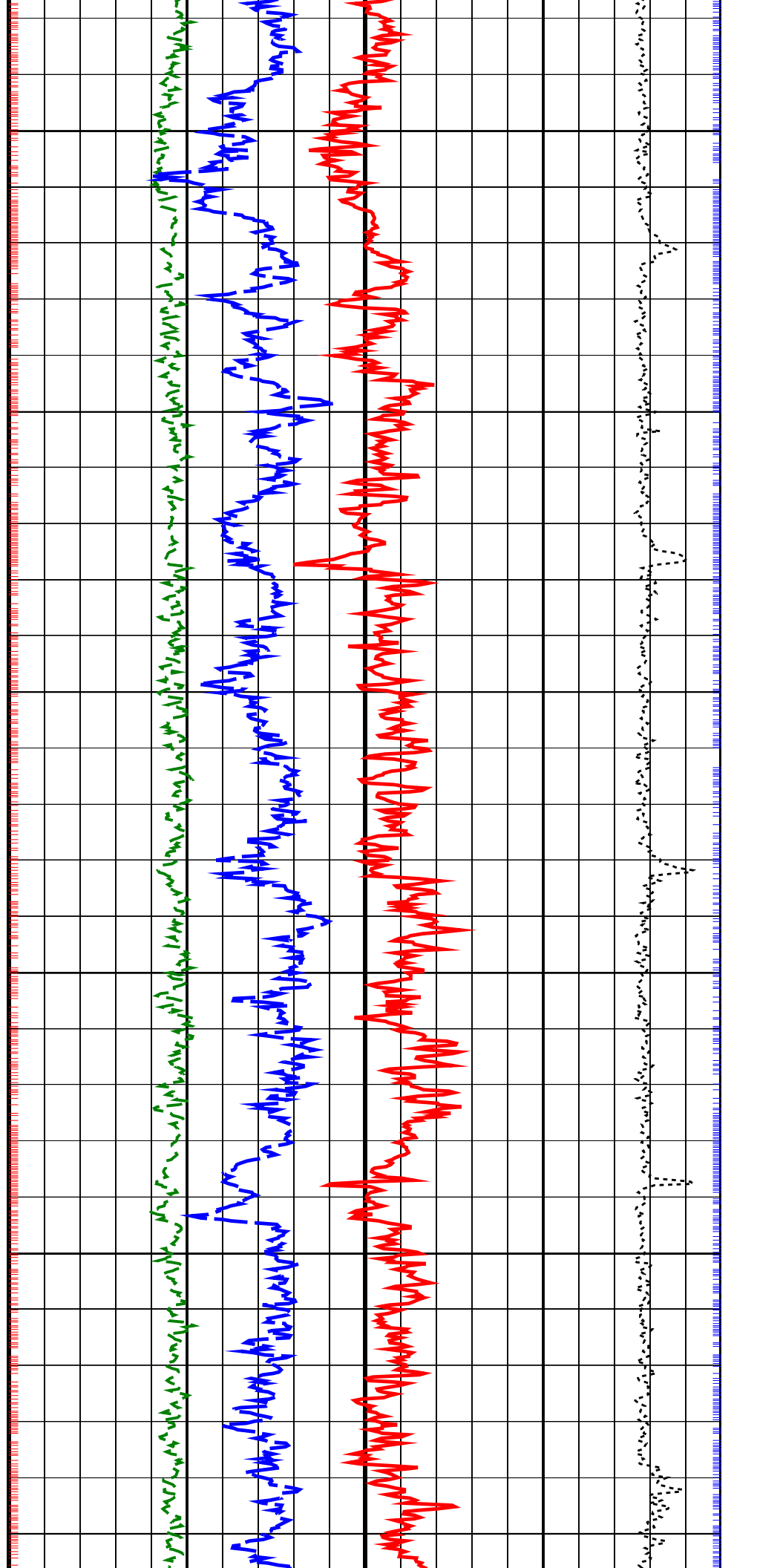
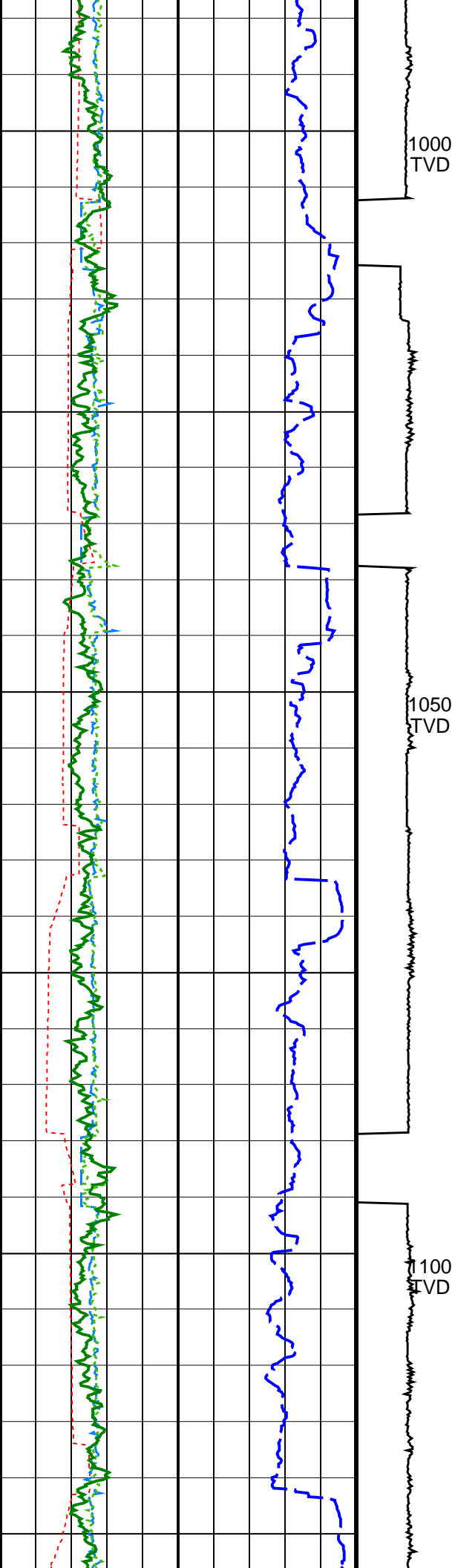
(DRHB)
-0.75 (G/C3) 0.25

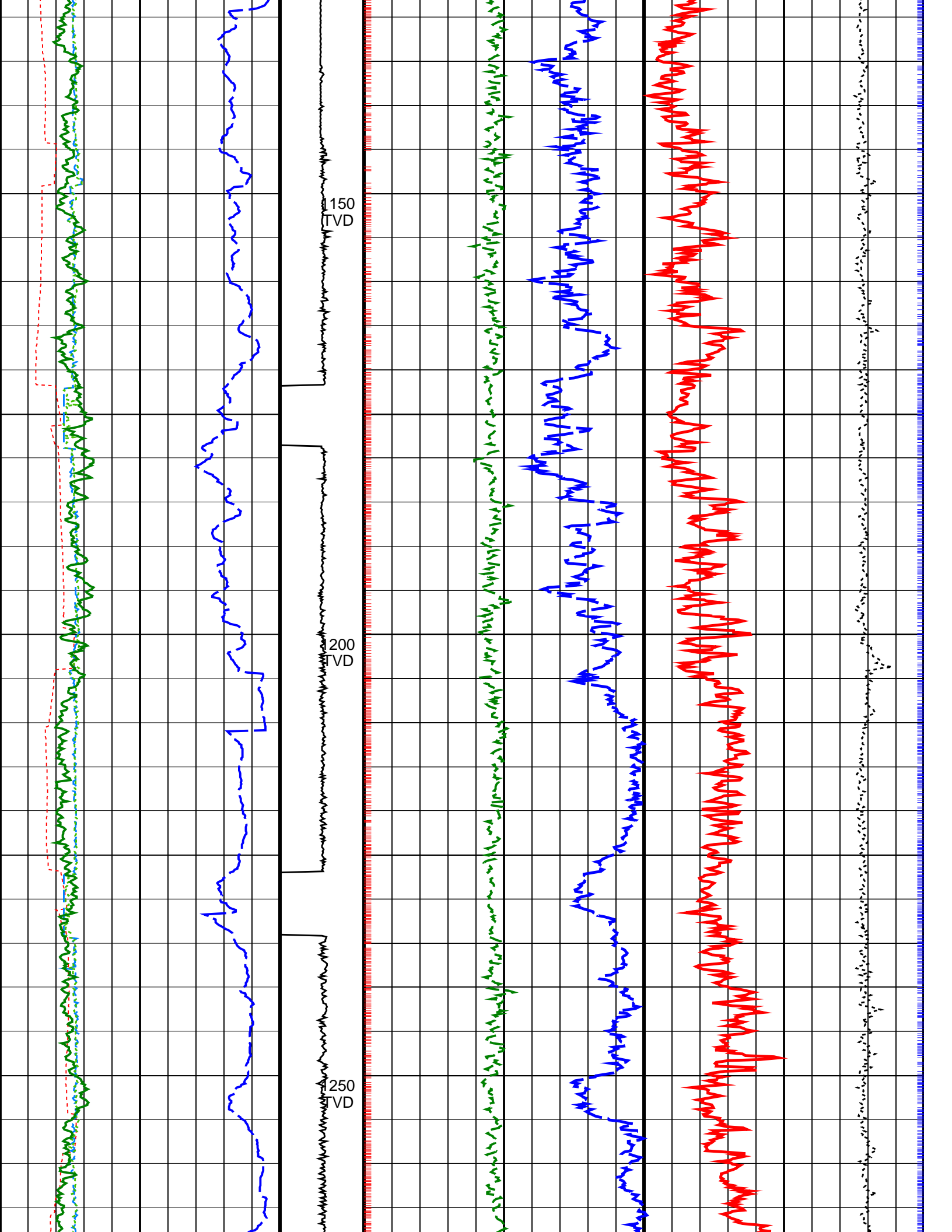
550
TVD

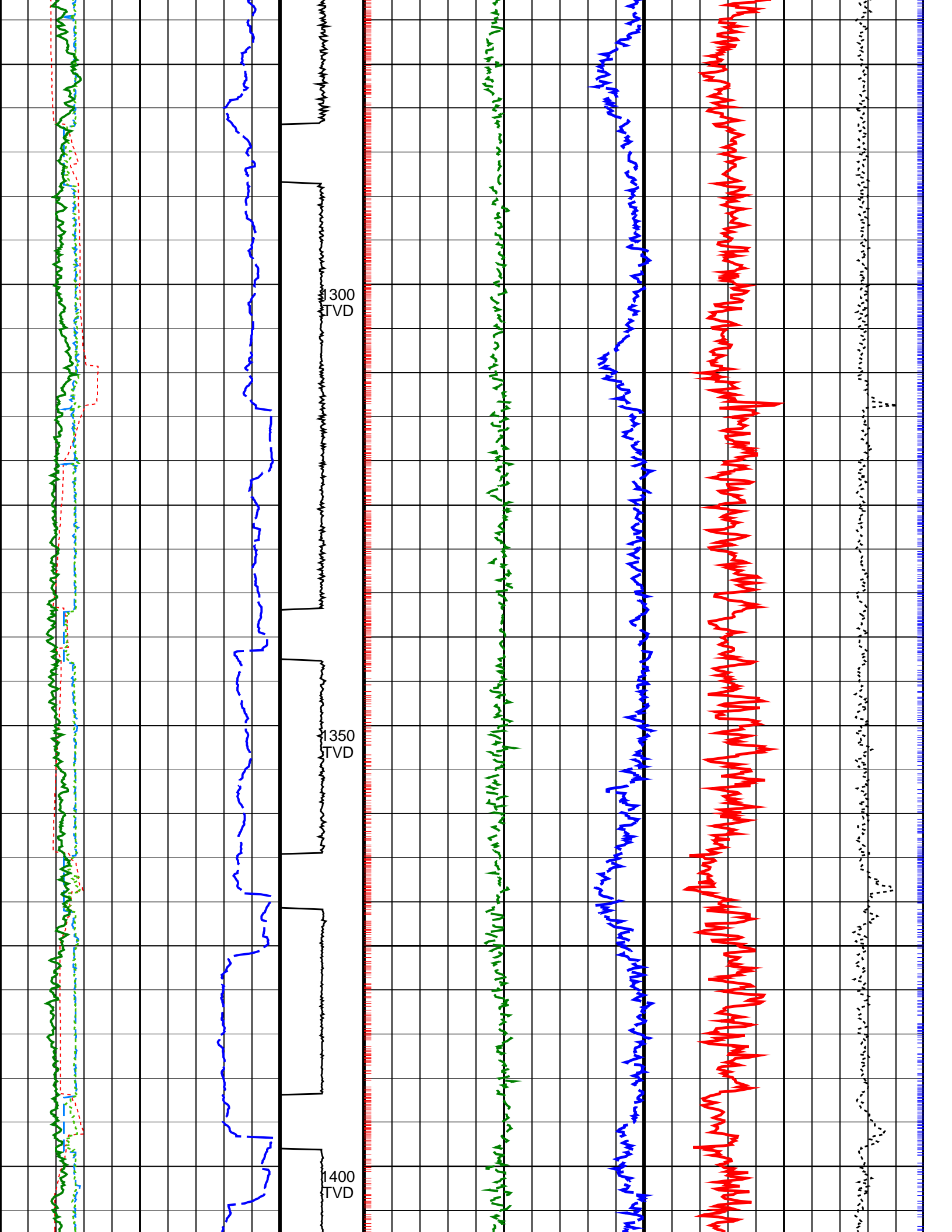


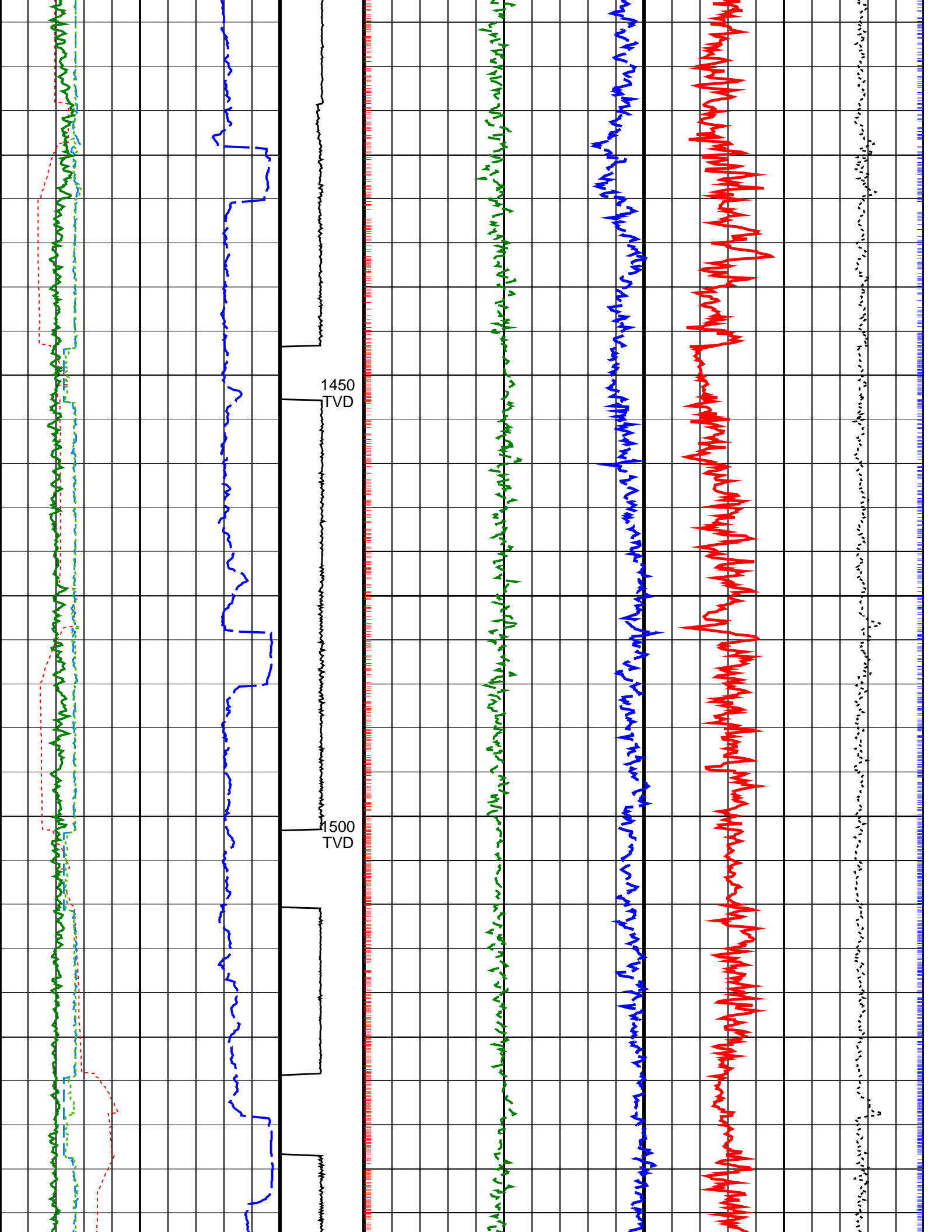


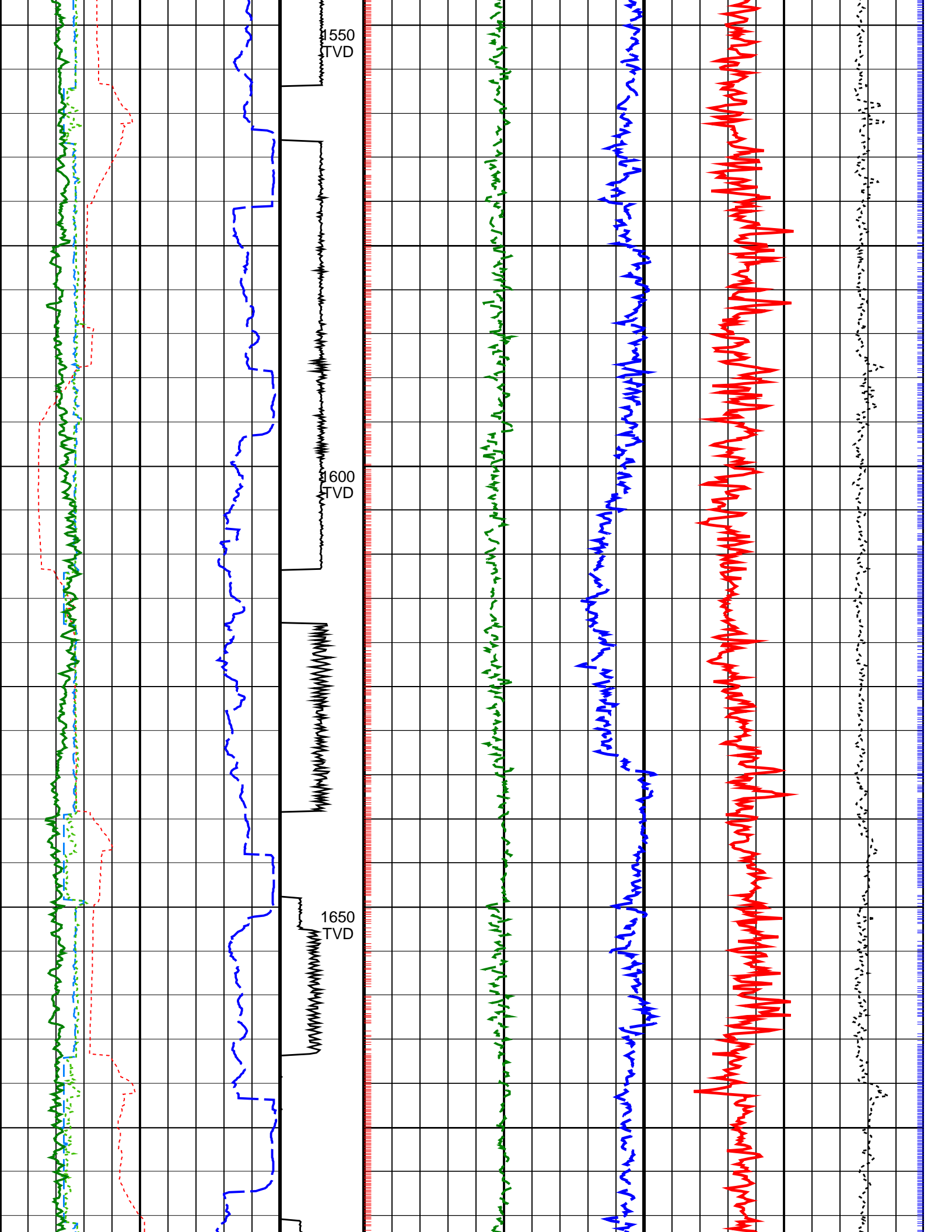


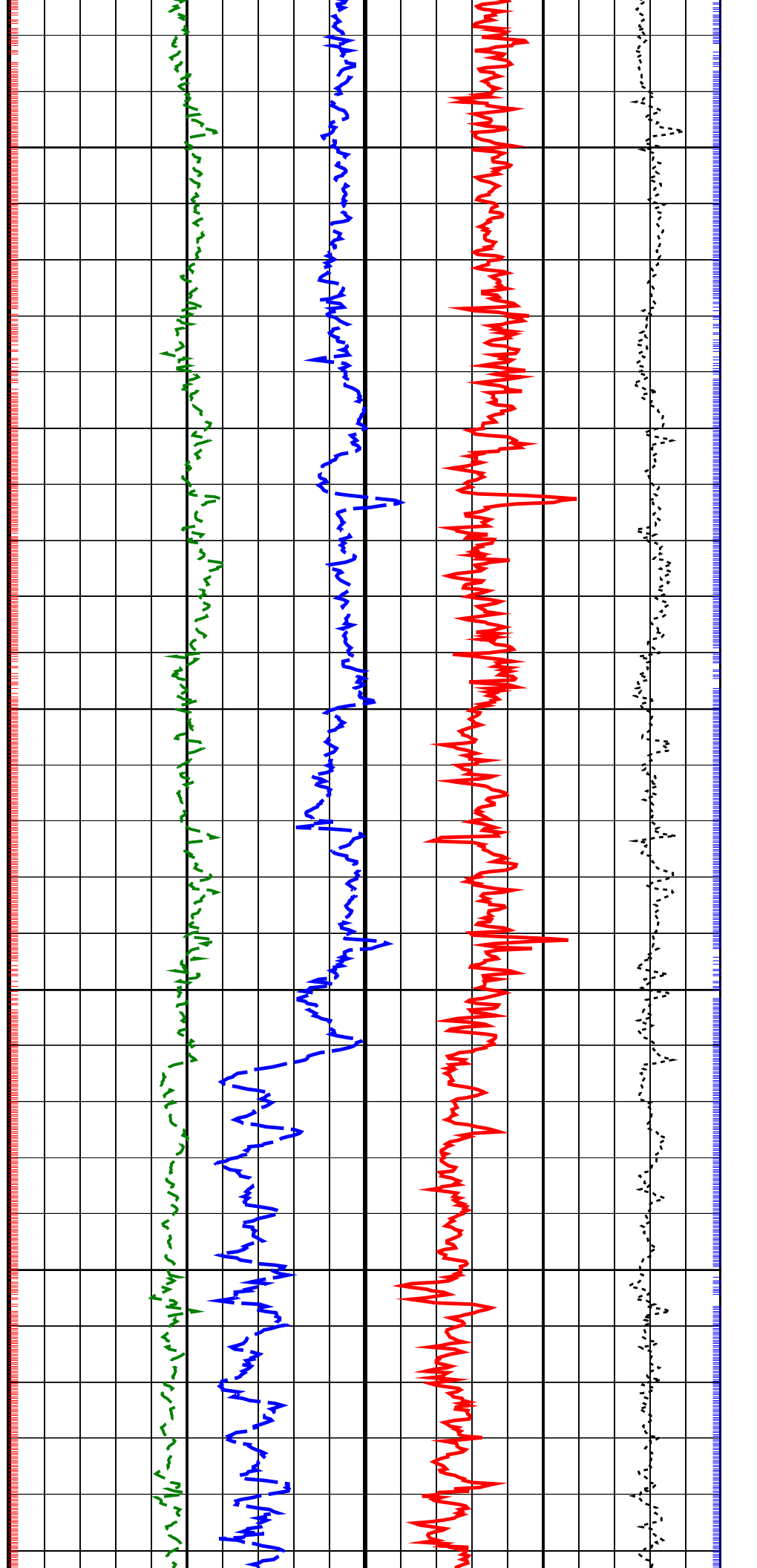
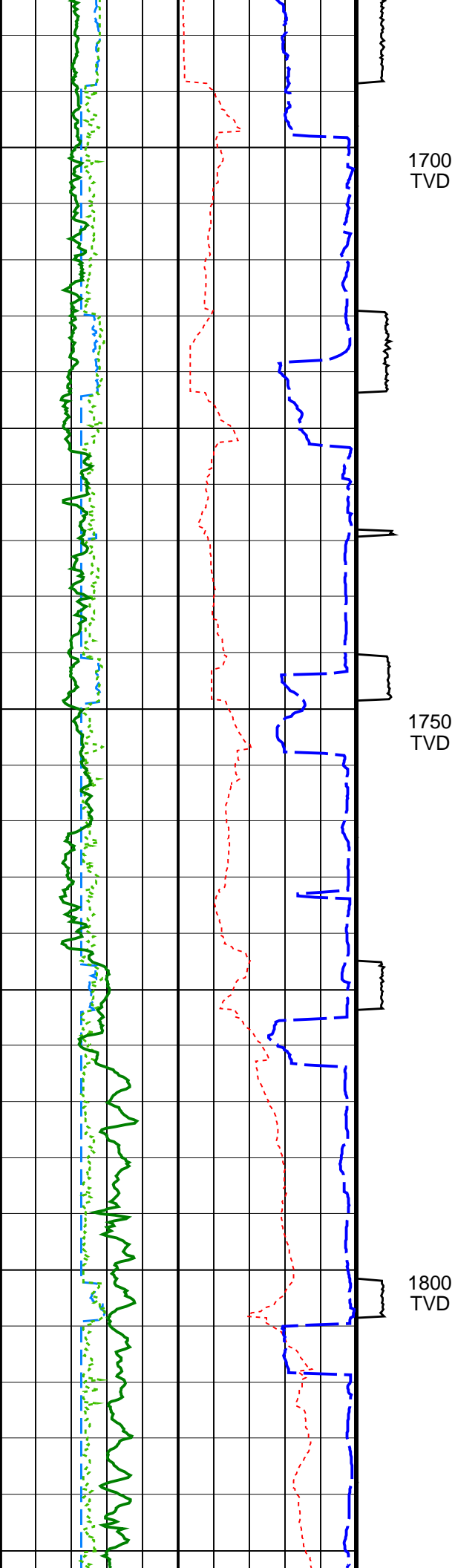


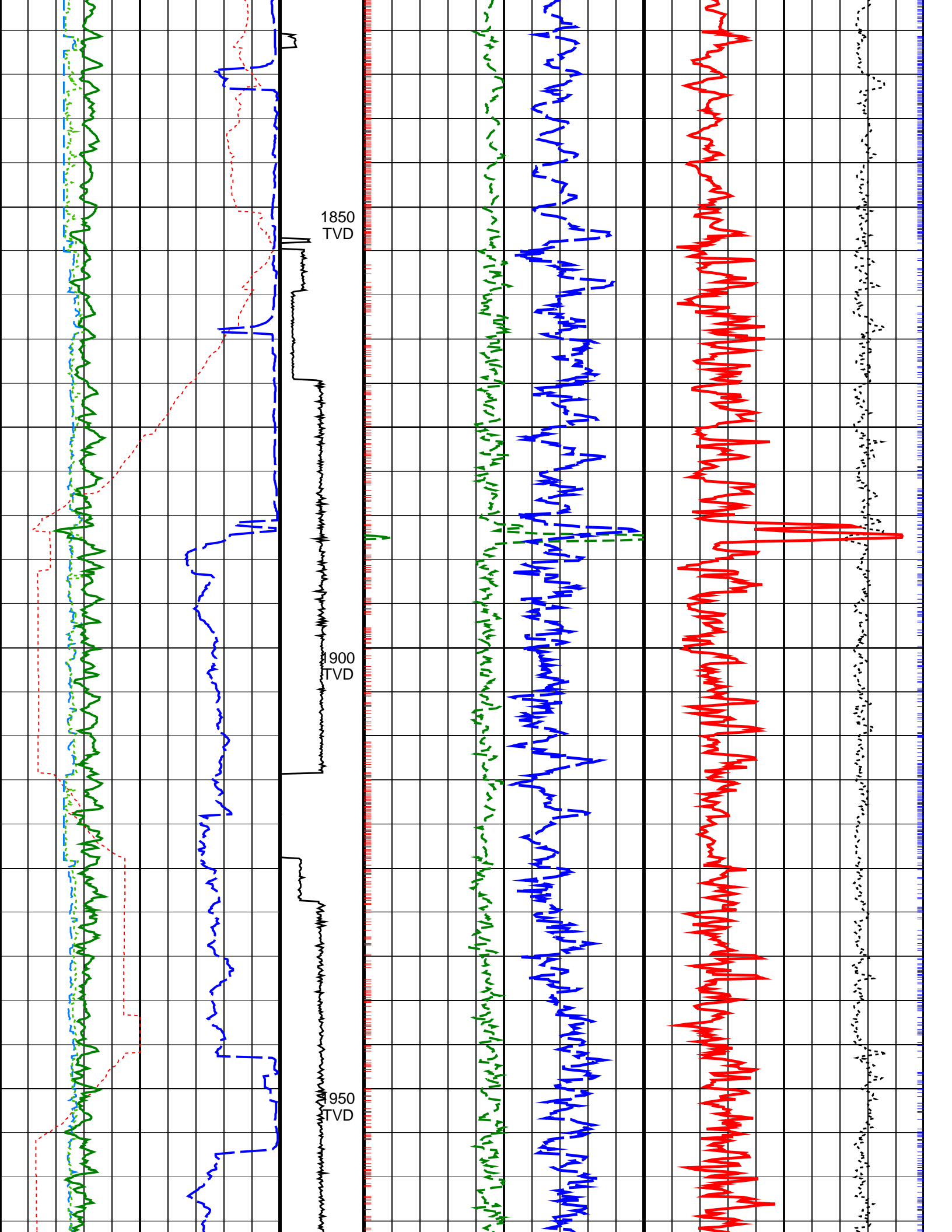


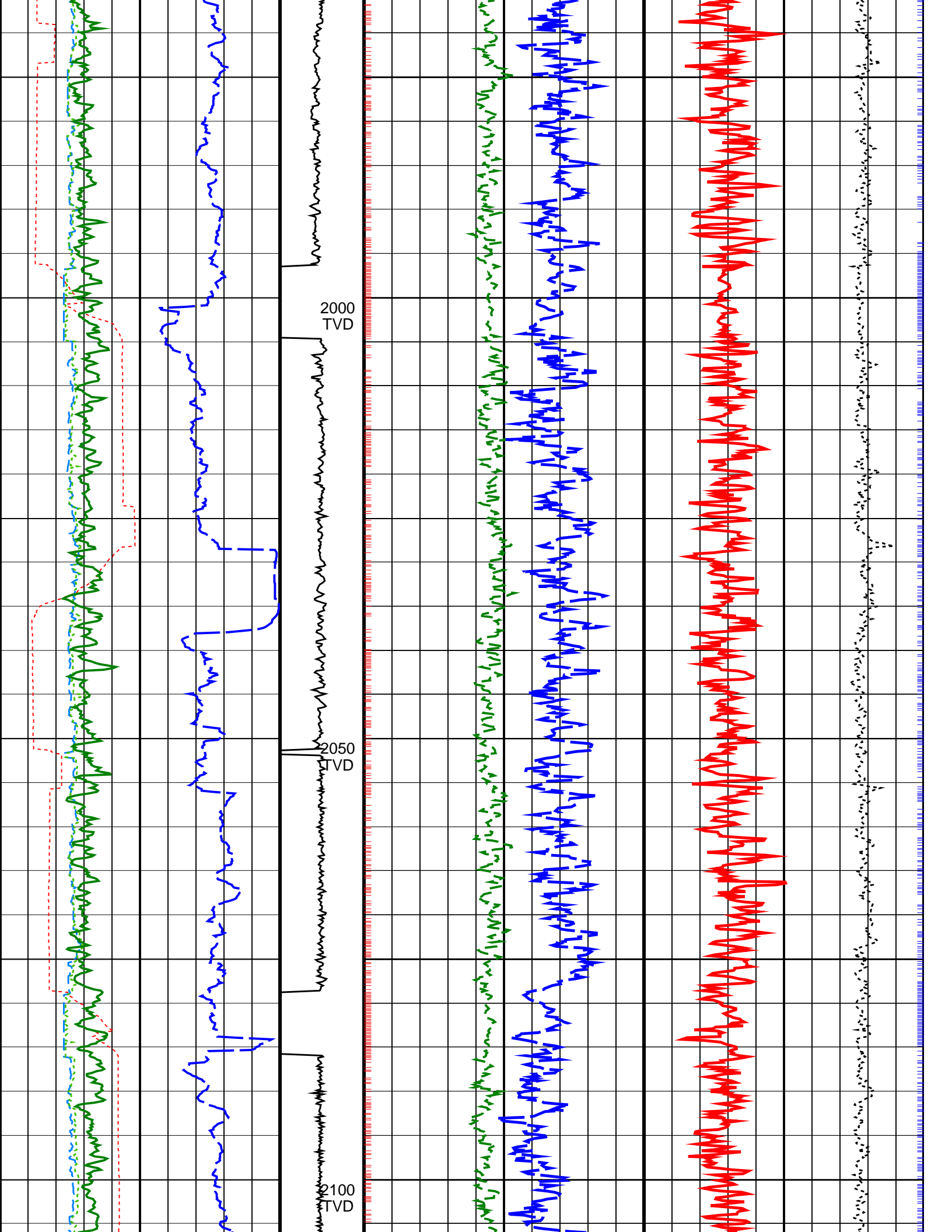


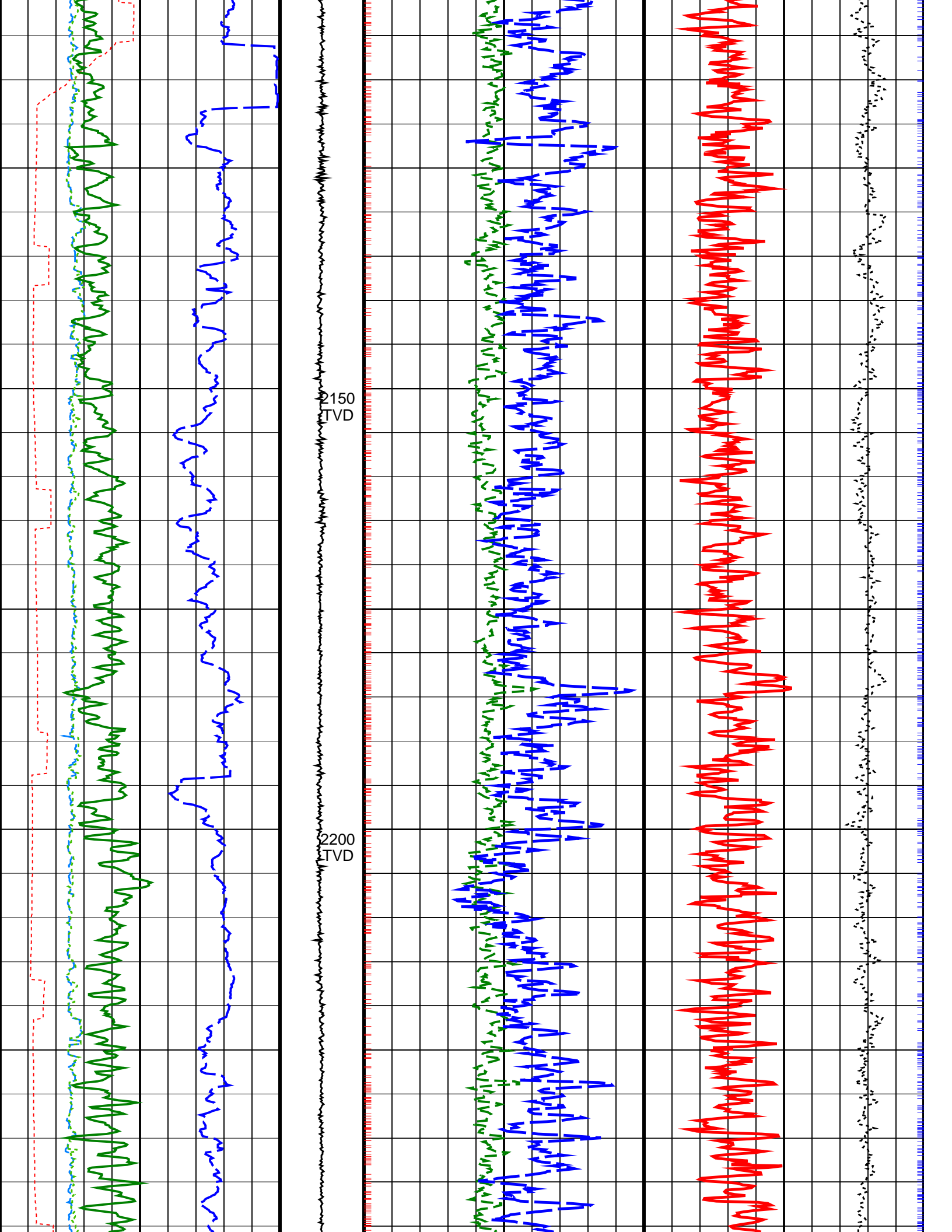


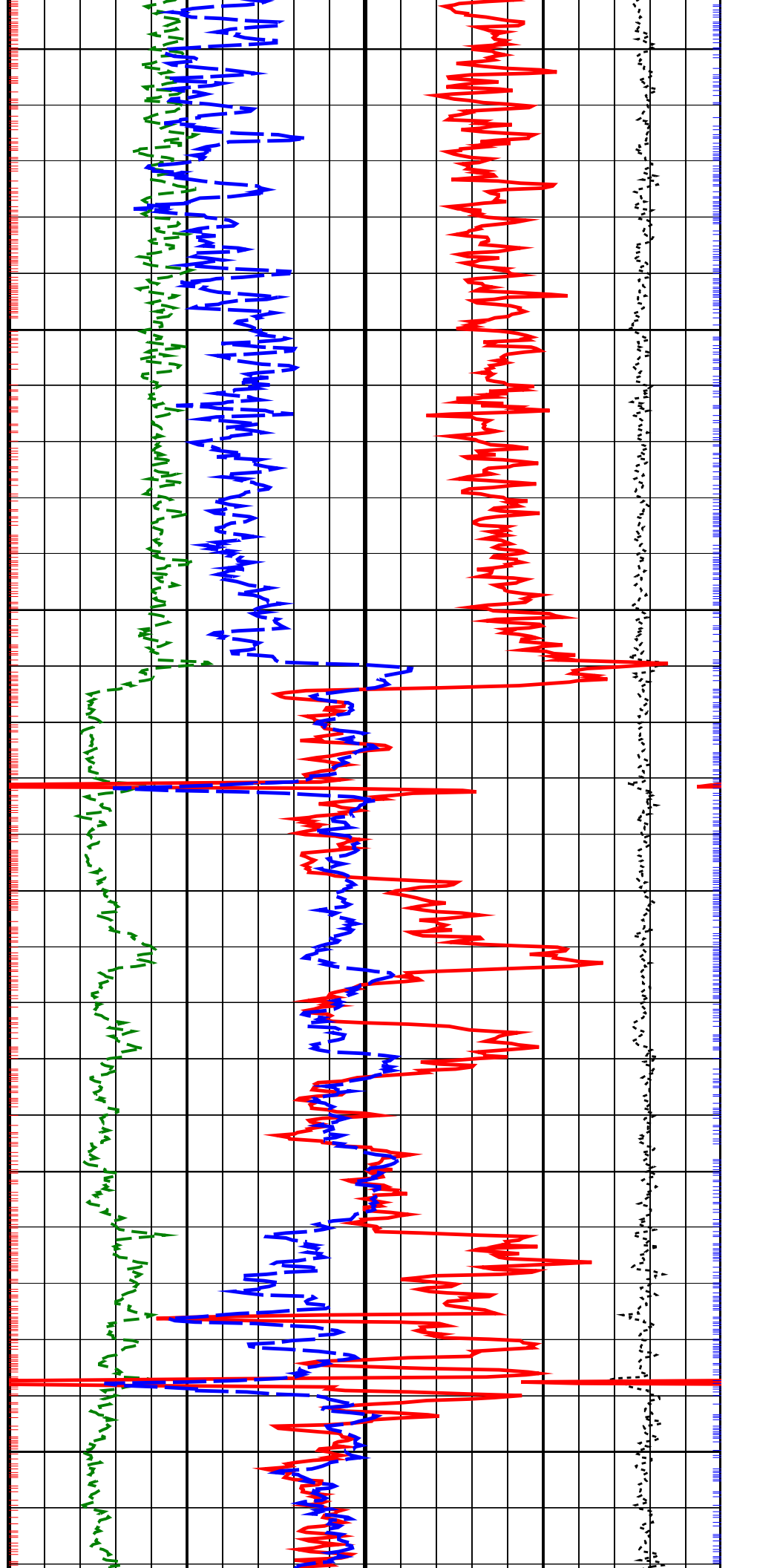
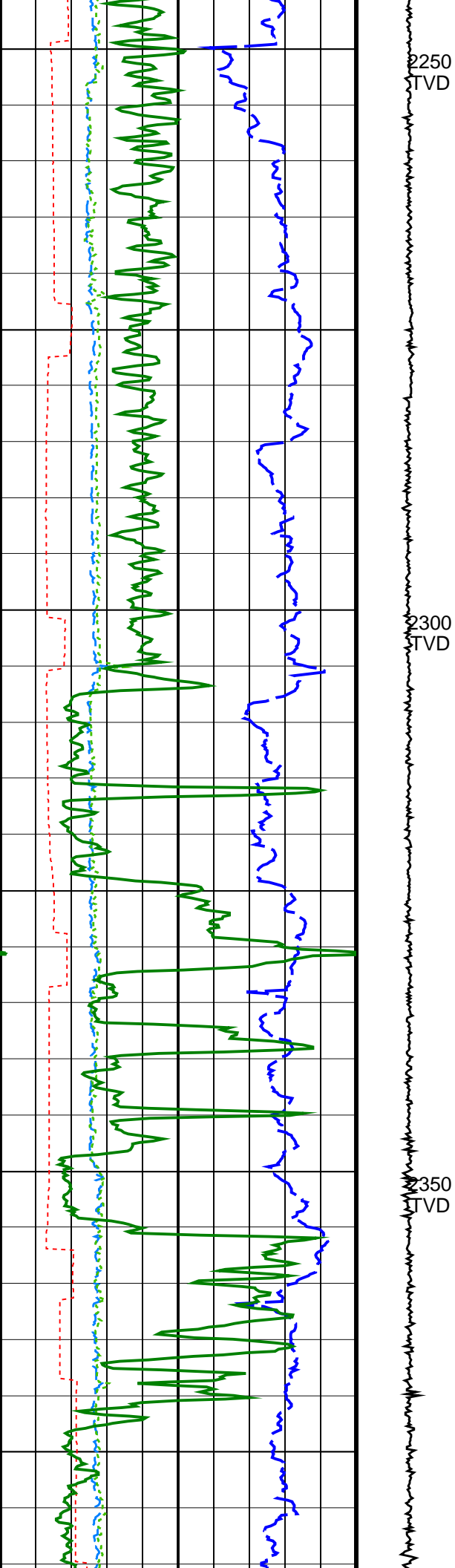


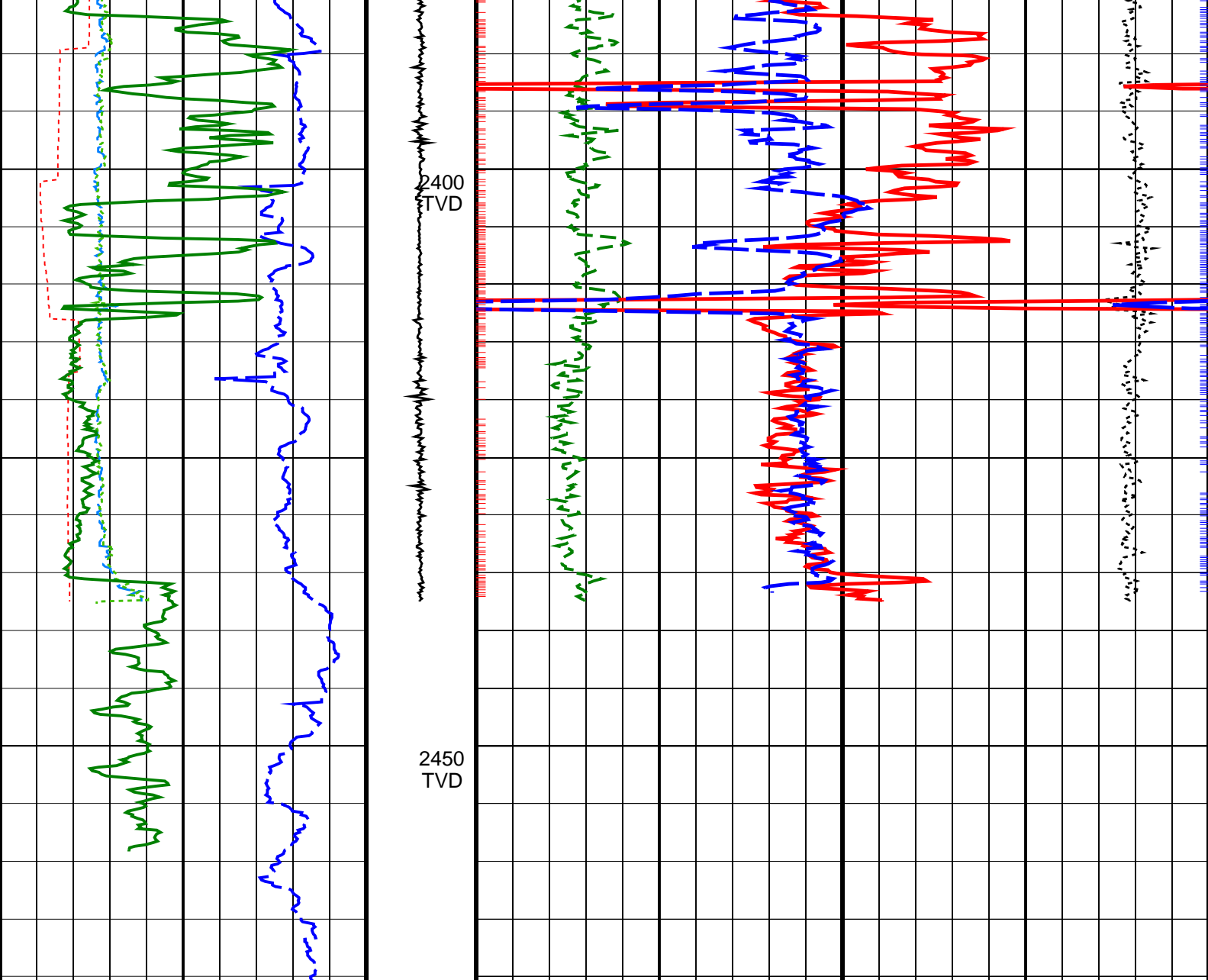












Density Time After Bit (TAB_DEN) (HR)	ADN Rotational Speed (RPM_ADN) (RPM)	Photoelectric Factor, Bottom (PEB) (G/C3)	Bulk Density Correction, Bottom (DRHB) (G/C3)
010	0250	010	-0.750.25
Horizontal Hole Diameter (HORD) (IN)		Bulk Density, Bottom (ROBB) (G/C3)	
616		1.852.85	
Vertical Hole Diameter (VERD) (IN)		Thermal Neutron Porosity (TNPH) (PU)	
616		45-15	
RAB Gamma Ray (GR_RAB) (GAPI)			
0200			
Rate of Penetration, Averaged over Last 5ft (ROP5_RM) (M/HR)			
2000			

PIP SUMMARY	Neutron Samples
Density Samples	

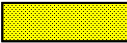
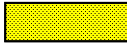
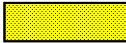
6.75-in. Azimuthal Density Neutron / Equipment Identification

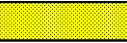
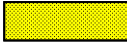
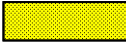
Primary Equipment:




Tool Name and Serial Number
Collar Type and Serial Number
Chassis Type and Serial Number
Stabilizer Type and Serial Number
Neutron Logging Source
Density Logging Source
Stabilizer Size
Calibration Status



ADN6 – CA
ADDC – AA
ADSE – EA
NSR – M
GSR – J/Z
8.25 – in.
AUTO –















425
AD09
425
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202
1994

Master: 28-Feb-2007 23:50									
6.75-in. Azimuthal Density Neutron Calibration									
Density: Magnesium Block									
Phase	LS window 3 – Mg CPS			Value	Phase	SS window 1 – Mg CPS			Value
Master				1005	Master				2496
	250.0	4125	8000			700.0	9350	18000	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase	SS window 3 – Mg CPS			Value					
Master				6180					
	2500	23750	45000						
	(Minimum)	(Nominal)	(Maximum)						

Master: 28-Feb-2007 23:50									
6.75-in. Azimuthal Density Neutron Calibration									
Density: Aluminum Block									
Phase	LS window 3 – Al CPS			Value	Phase	SS window 1 – Al CPS			Value
Master				149.7	Master				1268
	50.00	725.0	1400			500.0	4250	8000	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase	SS window 3 – Al CPS			Value					
Master				3876					
	1500	15750	30000						
	(Minimum)	(Nominal)	(Maximum)						

Master: 28-Feb-2007 23:50									
6.75-in. Azimuthal Density Neutron Calibration									
Density: Background									
Phase	LS window 3 – Background CPS			Value	Phase	SS window 1 – Background CPS			Value
Master				47.52	Master				117.5
	15.00	82.50	150.0			40.00	220.0	400.0	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase	SS window 3 – Background CPS			Value					
Master				523.7					
	150.0	825.0	1500						
	(Minimum)	(Nominal)	(Maximum)						













Master: 28-Feb-2007 23:50									
6.75-in. Azimuthal Density Neutron Calibration									
Density: Water Block Check									
Phase	Long spacing water density G/C3			Value	Phase	Short spacing water density G/C3			Value
Master				1.032	Master				1.125
	1.024	1.039	1.054			1.096	1.126	1.156	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	

Master: 28-Feb-2007 23:50									
6.75-in. Azimuthal Density Neutron Calibration									
Neutron: 3-Point Calibration									
Phase	Far 1 tube 1 Air Point Measure CPS			Value	Phase	Far 1 tube 1 Rod Point Measure CPS			Value
Master				18.01	Master				4.535
	13.30	19.05	24.70			3.400	4.857	6.200	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase	Far 1 tube 2 Air Point Measure CPS			Value	Phase	Far 1 tube 2 Rod Point Measure CPS			Value
Master				18.34	Master				4.535
	13.30	19.05	24.70			3.400	4.857	6.200	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase	Far 1 tube 3 Air Point Measure CPS			Value	Phase	Far 1 tube 3 Rod Point Measure CPS			Value
Master				17.81	Master				4.433
	13.30	19.05	24.70			3.400	4.857	6.200	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase	Far 2 tube 1 Air Point Measure CPS			Value	Phase	Far 2 tube 1 Rod Point Measure CPS			Value
Master				18.37	Master				4.728
	13.30	19.05	24.70			3.400	4.857	6.200	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase	Far 2 tube 2 Air Point Measure CPS			Value	Phase	Far 2 tube 2 Rod Point Measure CPS			Value
Master				17.76	Master				4.302
	13.30	19.05	24.70			3.400	4.857	6.200	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase	Far 2 tube 3 Air Point Measure CPS			Value	Phase	Far 2 tube 3 Rod Point Measure CPS			Value
Master					Master				
	13.30	19.05	24.70			3.400	4.857	6.200	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	
Phase	Far 2 tube 3 H2O Point Measure CPS			Value	Phase	Far 2 tube 3 H2O Point Measure CPS			Value
Master				2.050	Master				
	1.600	2.363	3.100			1.600	2.363	3.100	
	(Minimum)	(Nominal)	(Maximum)			(Minimum)	(Nominal)	(Maximum)	

Phase	Near 1 tube 1 Air Point Measure	CPS	Value	Phase	Near 1 tube 1 Rod Point Measure	CPS	Value	Phase	Near 1 tube 1 H2O Point Measure	CPS	Value	
Master			17.51	Master			4.325	Master			2.167	
13.30 (Minimum)			19.05 (Nominal)	24.70 (Maximum)			3.400 (Minimum)			4.857 (Nominal)	6.200 (Maximum)	
1.600 (Minimum)			2.363 (Nominal)			3.100 (Maximum)						
Phase	Near 1 tube 1 Air Point Measure	CPS	Value	Phase	Near 1 tube 1 Rod Point Measure	CPS	Value	Phase	Near 1 tube 1 H2O Point Measure	CPS	Value	
Master			475.5	Master			754.1	Master			330.0	
345.0 (Minimum)			487.5 (Nominal)	595.0 (Maximum)			535.0 (Minimum)			768.8 (Nominal)	925.0 (Maximum)	
230.0 (Minimum)			343.7 (Nominal)			430.0 (Maximum)						
Phase	Near 2 tube 1 Air Point Measure	CPS	Value	Phase	Near 2 tube 1 Rod Point Measure	CPS	Value	Phase	Near 2 tube 1 H2O Point Measure	CPS	Value	
Master			465.6	Master			734.5	Master			316.1	
345.0 (Minimum)			487.5 (Nominal)	595.0 (Maximum)			535.0 (Minimum)			768.8 (Nominal)	925.0 (Maximum)	
230.0 (Minimum)			343.7 (Nominal)			430.0 (Maximum)						

Master: 28-Feb-2007 23:50											
6.75-in. Azimuthal Density Neutron Calibration											
Neutron: Water Block Check											
Phase		Far Neutron water porosity PU								Value	
Master										98.45	
		90.00 (Minimum)		100.0 (Nominal)				125.0 (Maximum)			

6.75-in. Resistivity At-the-Bit / Equipment Identification											
Primary Equipment:				RAB6 - CA				223			
Tool Name and Serial Number				RAB6 - DC				41380			
Calibration Status											

Master: 1-Mar-2007 8:22														
6.75-in. Resistivity At-the-Bit Calibration														
Resistivity: Fixture														
Phase	Ring/T1 factor ----			Value	Phase	Ring/T2 factor ----			Value	Phase	M0/T1 factor ----			Value
Master				0.9978	Master				0.9996	Master				0.9888
0.9750 (Minimum)					0.9750 (Minimum)					0.9750 (Minimum)				
1.000 (Nominal)					1.000 (Nominal)					1.000 (Nominal)				
1.025 (Maximum)					1.025 (Maximum)					1.025 (Maximum)				
Phase	M0/T2 factor ----			Value	Phase	M2/T1 factor ----			Value	Phase	M2/T2 factor ----			Value
Master				0.9900	Master				0.9906	Master				0.9913
0.9750 (Minimum)					0.9750 (Minimum)					0.9750 (Minimum)				
1.000 (Nominal)					1.000 (Nominal)					1.000 (Nominal)				
1.025 (Maximum)					1.025 (Maximum)					1.025 (Maximum)				
Phase	BTN shallow/T1 factor ----			Value	Phase	BTN shallow/T2 factor ----			Value	Phase	BTN medium/T1 factor ----			Value
Master				0.9958	Master				0.9970	Master				0.9956
0.9750 (Minimum)					0.9750 (Minimum)					0.9750 (Minimum)				
1.000 (Nominal)					1.000 (Nominal)					1.000 (Nominal)				
1.025 (Maximum)					1.025 (Maximum)					1.025 (Maximum)				
Phase	BTN medium/T2 factor ----			Value	Phase	BTN deep/T1 factor ----			Value	Phase	BTN deep/T2 factor ----			Value
Master				0.9967	Master				0.9988	Master				1.000
0.9750 (Minimum)					0.9750 (Minimum)					0.9750 (Minimum)				
1.000 (Nominal)					1.000 (Nominal)					1.000 (Nominal)				
1.025 (Maximum)					1.025 (Maximum)					1.025 (Maximum)				

Master: Calibration date not found											
6.75-in. Resistivity At-the-Bit Calibration											
Gamma Ray: Blanket											
Phase		Gamma ray factor ----								Value	
Master										1.065	
		0.7500 (Minimum)		1.000 (Nominal)				1.250 (Maximum)			

Field..... Halibut
Well..... HLA A16A
Service number..... 07ASQ0001
Engineer..... R. Borjas, C.Skiba, A. Kohli
Rig..... ISDL 453
State..... Victoria

Spud date..... 6-Mar-07
Last survey date..... 13-Mar-07
Total accepted surveys.... 67
MD of first survey..... 548.00 m
MD of last survey..... 2568.00 m

----- Survey calculation methods-----
Method for positions..... Minimum curvature
Method for DLS..... Mason & Taylor

----- Geomagnetic data -----
Magnetic model..... BGGM version 2006
Magnetic date..... 04-Mar-2007
Magnetic field strength... 1199.26 HCNT
Magnetic dec (+E/W-)..... 13.23 degrees
Magnetic dip..... -68.86 degrees

----- Depth reference -----
Permanent datum..... Mean Sea Level
Depth reference..... Driller's Depth
GL above permanent..... -73.46 m
KB above permanent..... Top Drive
DF above permanent..... 29.45 m

----- MWD survey Reference Criteria -----
Reference G..... 1000.04 mGal
Reference H..... 1199.26 HCNT
Reference Dip..... -68.86 degrees
Tolerance of G..... (+/-) 2.50 mGal
Tolerance of H..... (+/-) 6.00 HCNT
Tolerance of Dip..... (+/-) 0.45 degrees

----- Vertical section origin-----
Latitude (+N/S-)..... -4.93 m
Departure (+E/W-)..... 22.42 m

----- Corrections -----
Magnetic dec (+E/W-)..... 13.23 degrees
Grid convergence (+E/W-).. -0.82 degrees
Total az corr (+E/W-)..... 14.05 degrees
(Total az corr = magnetic dec - grid conv)

Azimuth from Vsect Origin to target: 349.86 degrees

Survey Correction Type ...:
I=Sag Corrected Inclination
M=Schlumberger Magnetic Correction
S=Shell Magnetic Correction
F=Failed Axis Correction
R=Magnetic Resonance Tool Correction
D=Dmag Magnetic Correction

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Seq #	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 100f)	Srvy tool type	Tool Corr (deg)
1	548.00	0.94	337.08	0.00	547.49	13.21	7.90	19.13	20.70	67.56	0.00	TIP	None
2	656.32	10.57	84.32	108.32	655.21	13.30	9.71	28.70	30.30	71.31	3.06	MWD	None
3	685.87	14.32	81.21	29.55	684.06	13.01	10.53	35.01	36.56	73.25	3.93	MWD	None
4	744.08	17.37	73.57	58.21	740.06	13.79	14.09	50.46	52.39	74.40	1.93	MWD	None
5	772.79	17.62	65.58	28.71	767.44	15.33	17.10	58.53	60.98	73.71	2.56	MWD	None
6	801.94	16.58	55.50	29.15	795.31	18.13	21.28	65.98	69.33	72.12	3.28	MWD	None
7	831.30	15.60	40.08	29.36	823.53	22.39	26.68	71.98	76.76	69.66	4.54	MWD	None
8	860.62	15.15	21.95	29.32	851.82	28.16	33.25	75.95	82.91	66.35	5.00	MWD	None
9	889.74	15.19	3.66	29.12	879.94	35.10	40.59	77.62	87.59	62.39	4.99	MWD	None
10	919.16	14.67	346.80	29.42	908.38	42.56	48.07	77.01	90.78	58.03	4.52	MWD	None
11	948.16	15.00	327.62	29.00	936.43	49.71	54.82	74.16	92.22	53.53	5.15	MWD	None
12	977.35	16.46	314.43	29.19	964.54	56.58	60.91	69.18	92.17	48.64	4.02	MWD	None
13	1006.69	17.00	311.99	29.34	992.63	63.35	66.69	63.03	91.76	43.38	0.92	MWD	None
14	1036.13	17.37	307.55	29.44	1020.76	70.00	72.24	56.34	91.62	37.95	1.41	MWD	None
15	1065.33	18.29	306.81	29.20	1048.56	76.57	77.65	49.22	91.93	32.37	0.99	MWD	None
16	1094.18	19.18	307.46	28.85	1075.88	83.38	83.24	41.83	93.16	26.68	0.97	MWD	None
17	1123.54	18.98	307.33	29.36	1103.63	90.46	89.07	34.21	95.41	21.01	0.21	MWD	None
18	1152.75	19.85	306.31	29.21	1131.18	97.55	94.89	26.43	98.50	15.57	0.97	MWD	None
19	1181.80	19.61	306.41	29.05	1158.52	104.66	100.70	18.54	102.39	10.43	0.25	MWD	None
20	1210.82	19.25	306.51	29.02	1185.89	111.68	106.44	10.77	106.98	5.78	0.38	MWD	None
21	1240.00	19.93	306.94	29.18	1213.38	118.82	112.29	2.93	112.33	1.49	0.73	MWD	None
22	1269.33	19.36	307.22	29.33	1241.00	126.05	118.23	-4.94	118.34	357.61	0.60	MWD	None
23	1298.55	20.02	307.69	29.22	1268.51	133.32	124.22	-12.75	124.87	354.14	0.71	MWD	None
24	1327.92	19.44	307.77	29.37	1296.16	140.68	130.29	-20.59	131.90	351.02	0.60	MWD	None
25	1356.83	19.95	308.74	28.91	1323.38	147.96	136.32	-28.24	139.22	348.30	0.64	MWD	None
26	1386.04	19.24	308.72	29.21	1350.89	155.34	142.45	-35.88	146.90	345.86	0.74	MWD	None
27	1415.27	19.39	308.30	29.23	1378.48	162.60	148.47	-43.45	154.70	343.69	0.21	MWD	None
28	1444.21	19.41	308.06	28.94	1405.78	169.78	154.41	-51.01	162.62	341.72	0.09	MWD	None
29	1473.38	19.67	307.38	29.17	1433.27	177.01	160.38	-58.72	170.79	339.89	0.36	MWD	None
30	1502.56	19.40	307.48	29.18	1460.77	184.22	166.31	-66.47	179.10	338.21	0.28	MWD	None

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Seq #	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 100f)	Srvy tool type	Tool Corr (deg)
31	1531.60	19.72	307.18	29.04	1488.13	191.38	172.21	-74.20	187.51	336.69	0.35	MWD	None
32	1561.14	18.65	307.09	29.54	1516.03	198.51	178.07	-81.94	196.02	335.29	1.10	MWD	None
33	1590.33	19.23	308.40	29.19	1543.64	205.54	183.87	-89.43	204.46	334.06	0.75	MWD	None
34	1619.52	19.80	309.76	29.19	1571.15	212.92	190.01	-97.00	213.34	332.96	0.76	MWD	None
35	1648.64	20.19	310.80	29.12	1598.52	220.60	196.45	-104.60	222.56	331.97	0.55	MWD	None
36	1677.99	19.54	310.73	29.35	1626.12	228.34	202.96	-112.15	231.89	331.08	0.68	MWD	None
37	1707.19	19.61	312.18	29.20	1653.63	236.01	209.44	-119.48	241.12	330.30	0.51	MWD	None
38	1736.04	19.50	315.68	28.85	1680.82	243.82	216.14	-126.43	250.40	329.67	1.24	MWD	None
39	1765.24	19.46	320.51	29.20	1708.35	252.09	223.38	-132.93	259.94	329.24	1.68	MWD	None
40	1794.75	19.59	328.46	29.51	1736.17	260.98	231.39	-138.65	269.75	329.07	2.75	MWD	None
41	1823.72	18.91	336.29	28.96	1763.51	270.07	239.83	-143.07	279.26	329.18	2.81	MWD	None
42	1852.64	18.73	346.24	28.93	1790.90	279.26	248.63	-146.06	288.36	329.57	3.38	MWD	None
43	1881.73	18.99	356.48	29.09	1818.44	288.63	257.89	-147.47	297.08	330.24	3.47	MWD	None
44	1911.25	19.50	5.97	29.52	1846.28	298.23	267.69	-147.24	305.51	331.19	3.39	MWD	None
45	1944.25	19.56	15.27	29.52	1873.40	307.55	277.62	-147.23	312.55	332.26	3.55	MWD	None

45	1940.24	20.56	15.85	28.99	1873.49	307.55	277.49	-145.33	313.25	332.36	3.65	MWD	None
46	1969.40	20.43	20.15	29.16	1900.81	316.54	287.20	-142.18	320.47	333.66	1.58	MWD	None
47	1998.50	20.09	19.94	29.10	1928.11	325.26	296.67	-138.73	327.50	334.94	0.36	MWD	None
48	2027.99	20.71	21.60	29.49	1955.75	334.07	306.27	-135.08	334.74	336.20	0.88	MWD	None
49	2056.89	20.27	22.08	28.90	1982.82	342.65	315.66	-131.32	341.89	337.41	0.50	MWD	None
50	2086.28	19.74	22.29	29.39	2010.44	351.15	324.97	-127.52	349.10	338.57	0.55	MWD	None
51	2115.81	20.17	21.11	29.53	2038.19	359.71	334.34	-123.80	356.52	339.68	0.61	MWD	None
52	2144.95	19.65	20.95	29.14	2065.59	368.20	343.60	-120.24	364.03	340.71	0.55	MWD	None
53	2173.94	19.08	20.83	28.99	2092.94	376.44	352.58	-116.81	371.43	341.67	0.60	MWD	None
54	2203.27	19.38	21.50	29.33	2120.64	384.69	361.59	-113.32	378.93	342.60	0.39	MWD	None
55	2232.55	18.75	22.03	29.28	2148.31	392.81	370.47	-109.77	386.39	343.50	0.68	MWD	None
56	2261.57	18.25	21.56	29.02	2175.83	400.63	379.02	-106.36	393.66	344.33	0.55	MWD	None
57	2290.92	17.77	21.06	29.35	2203.74	408.37	387.48	-103.06	400.95	345.11	0.52	MWD	None
58	2319.71	17.34	20.41	28.79	2231.19	415.82	395.60	-99.98	408.04	345.82	0.50	MWD	None
59	2348.52	16.83	20.03	28.81	2258.73	423.12	403.54	-97.06	415.05	346.48	0.55	MWD	None
60	2378.11	16.33	19.61	29.59	2287.09	430.44	411.48	-94.19	422.13	347.11	0.53	MWD	None

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Seq #	Measured depth (m)	Incl angle (deg)	Azimuth angle (deg)	Course length (m)	TVD depth (m)	Vertical section (m)	Displ +N/S- (m)	Displ +E/W- (m)	Total displ (m)	At Azim (deg)	DLS (deg/ 100f)	Srvy tool type	Tool Corr (deg)
61	2406.95	16.08	19.04	28.84	2314.78	437.45	419.08	-91.53	428.96	347.68	0.31	MWD	None
62	2436.57	16.02	18.94	29.62	2343.25	444.60	426.82	-88.86	435.97	348.24	0.07	MWD	None
63	2465.76	15.72	18.83	29.19	2371.33	451.58	434.37	-86.28	442.86	348.77	0.31	MWD	None
64	2494.86	15.59	18.51	29.10	2399.35	458.46	441.81	-83.77	449.68	349.26	0.16	MWD	None
65	2524.08	15.38	18.63	29.22	2427.51	465.30	449.21	-81.28	456.50	349.74	0.22	MWD	None
66	2549.57	15.54	18.13	25.49	2452.07	471.27	455.66	-79.14	462.48	350.15	0.25	MWD	None
67	2568.00	15.50	18.00	18.43	2469.83	475.62	460.34	-77.61	466.84	350.43	0.09	Proj.	to TD

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Company:
Esso Australia Pty. Ltd.

Well:
HLA A16A

Field:
Halibut

Rig:
ISDL 453

State:
Victoria

Schlumberger

GeoVISION Density Neutron
1:500 True Vertical Depth
Recorded Memory