Weatherford®

ARRAY INDUCTION SHALLOW FOCUSED ELECTRIC LOG

COMPANY	MURFIN DRILLING COMPANY, INC.
WELL	MOONRAKER #6-27
FIELD	WILDCAT
PROVINCE/COUNTY	LINCOLN
COUNTRY/STATE	U.S.A. / COLORADO
LOCATION	2300' FNL & 1500' FWL

SEC 27	TWP 10S	RGE 56W
Latitude		39.150720
Longitude		-103.654100
API Number		05-073-06757

Other Services
MPD/MDN MML
MSS

Permanent Datum GL, Elevation 5462 feet
Log Measured From KB, 13.00 feet above Permanent Datum
Drilling Measured From KB

Elevations:	feet
KB	5475.00
DF	5473.00
GL	5462.00

Date	20-JAN-2019			
Run Number	ONE			
Service Order	17876-235128055			
Depth Driller	8300.00	feet		
Depth Logger	8303.00	feet		
First Reading	---			
Last Reading	---			
Casing Driller	455.00	feet		
Casing Logger	443.00	feet		
Bit Size	7.875	inches		
Hole Fluid Type	CHEMICAL			
Density / Viscosity	9.40 lb/USg		90.00 sec/qt	
PH / Fluid Loss	10.50		8.00 ml/30Min	
Sample Source	FLOWLINE			
Rm @ Measured Temp	0.76 @ 94.0	ohm-m		
Rmf @ Measured Temp	0.57 @ 94.0	ohm-m		
Rmc @ Measured Temp	0.91 @ 94.0	ohm-m		
Source Rmf / Rmc	CALC		CALC	
Rm @ BHT	0.40 @179.0	ohm-m		
Time Since Circulation	5 HOURS			
Max Recorded Temp	179.00	deg F		
Equipment / Base	13096		LIB	
Recorded By	BANDAR BINOSFUR			
Witnessed By	GREGG SMITH			

Last Edited: 20-JAN-2019 13:54

BOREHOLE RECORD

Bit Size inches	Depth From feet	Depth To feet
7.875	455.00	8300.00

CASING RECORD

Type	Size inches	Depth From feet	Shoe Depth feet	Weight pounds/ft
SURFACE	8.625	0.00	455.00	24.00

REMARKS

- SOFTWARE ISSUE: WLS 18.03.9344.

- RUN ONE: SHA, MCG, MML, MDN, MPD, SKJ, MFE, MSS, MAI RAN IN COMBINATION.
- RUN TWO: SHA, MCG, MSS RAN IN COMBINATION.

- HARDWARE: DUAL BOWSPRING USED ON MDN.
0.5 INCH STANDOFF USED ON MFE.
TWO 0.5 INCH STANDOFFS USED ON MSS.
0.5 INCH STANDOFF USED ON MAI.

- 2.71 G/CC LIMESTONE DENSITY MATRIX USED TO CALCULATE POROSITY.

- BOREHOLE RUGOSITY, TIGHT PULLS, AND WASHOUTS WILL AFFECT DATA QUALITY.

- CALIPERS CLOSED FROM 5707' UNTIL 5594' DUE TO CLIENT REQUEST.

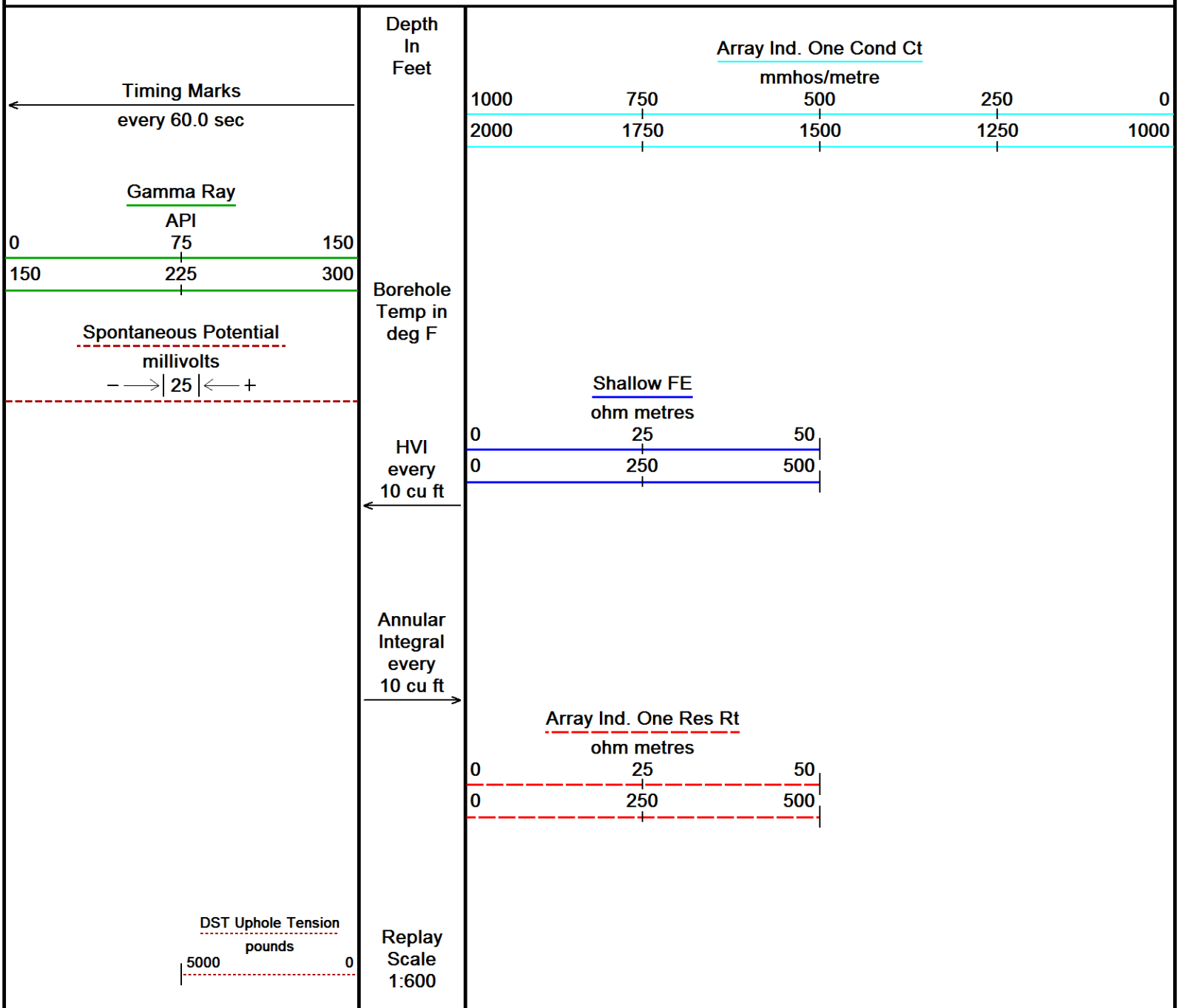
- ALL INTERVALS LOGGED AND SCALED PER CUSTOMER'S REQUEST.

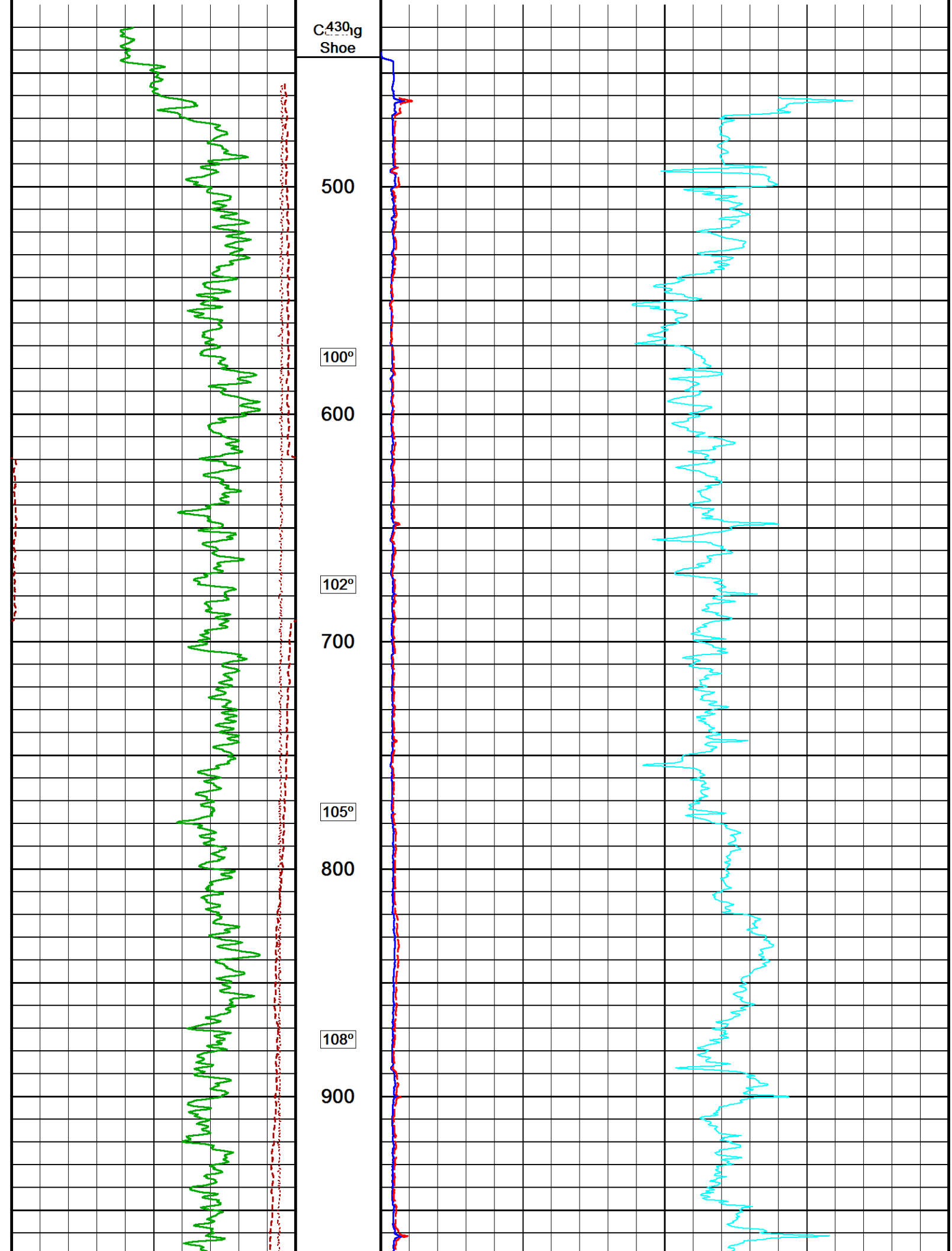
- ENGINEER: B. BINOSFUR.

- OPERATOR: B. TOVAR, B. COPELAND.

2 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Plotted on 20-JAN-2019 14:05
Filename: C:\Minimus 18.03.9344\Data\Murfin Moonraker #6-27\MERGED MAIN PASS final.dta
Recorded on 20-JAN-2019 03:03
System Versions: Plotted with 18.03.9344




C430ng
Shoe
500
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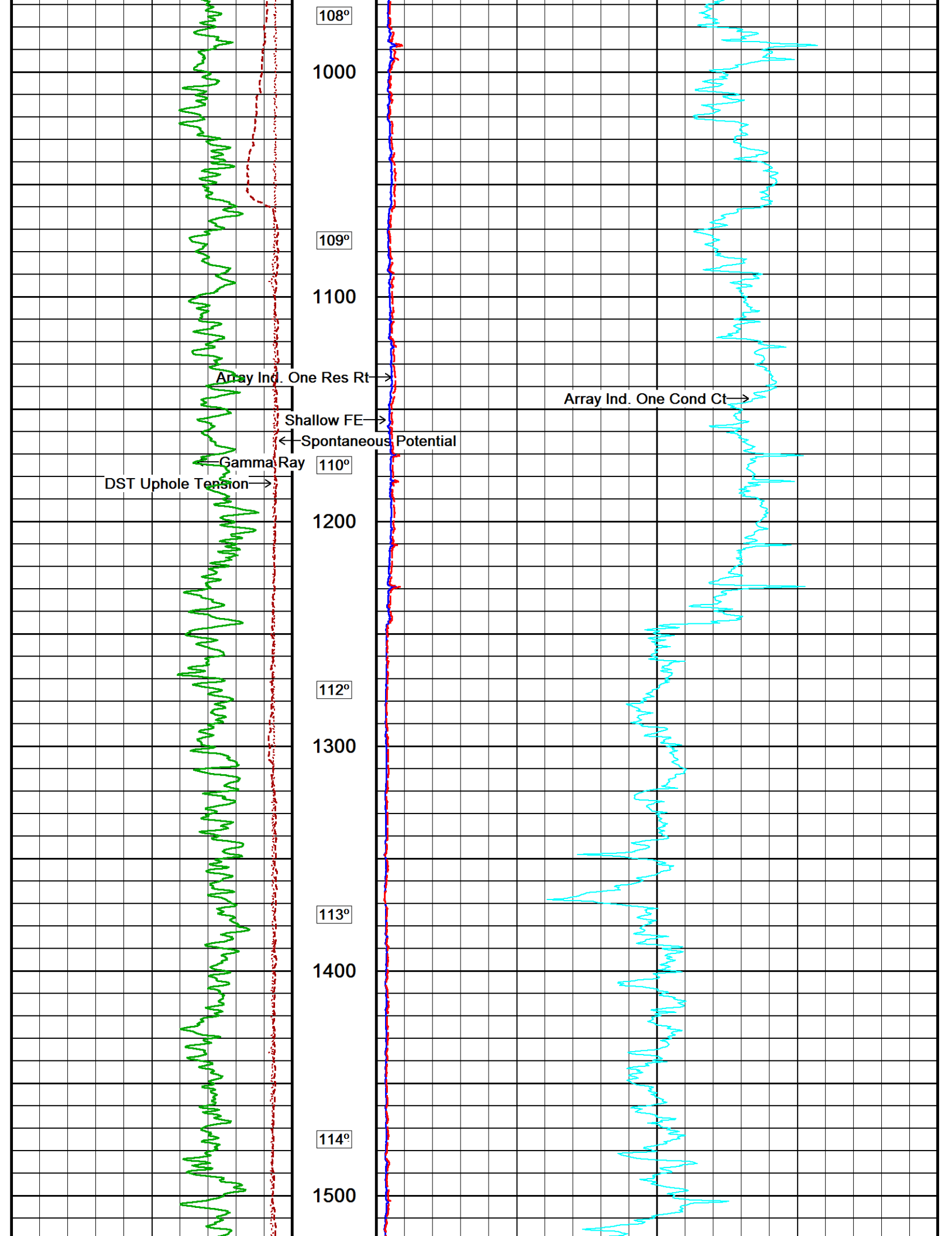
600
102°
700
105°
800
108°
900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1000
109°
1100
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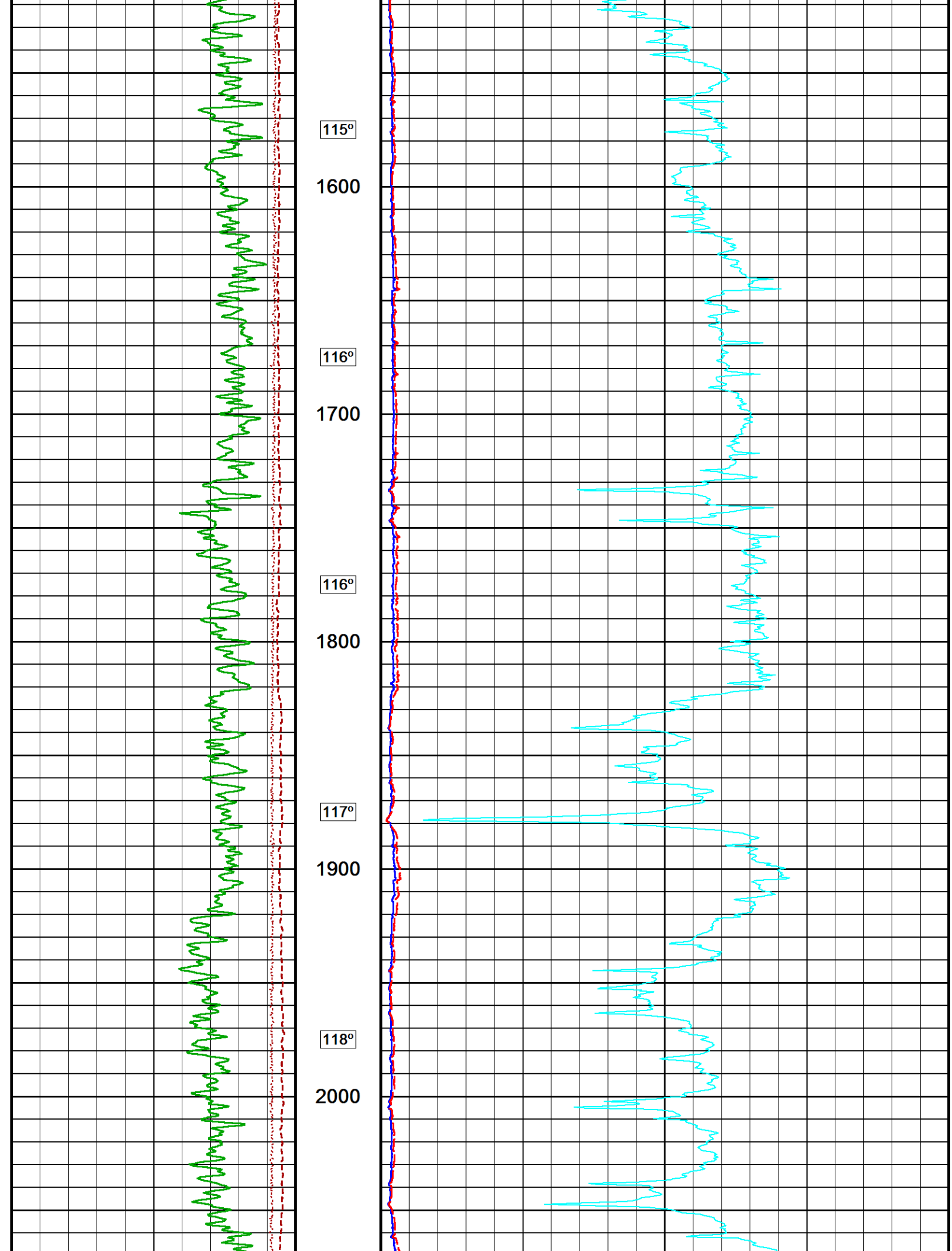
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
110°
DST Uphole Tension
1200
112°
1300
113°
1400
114°
1500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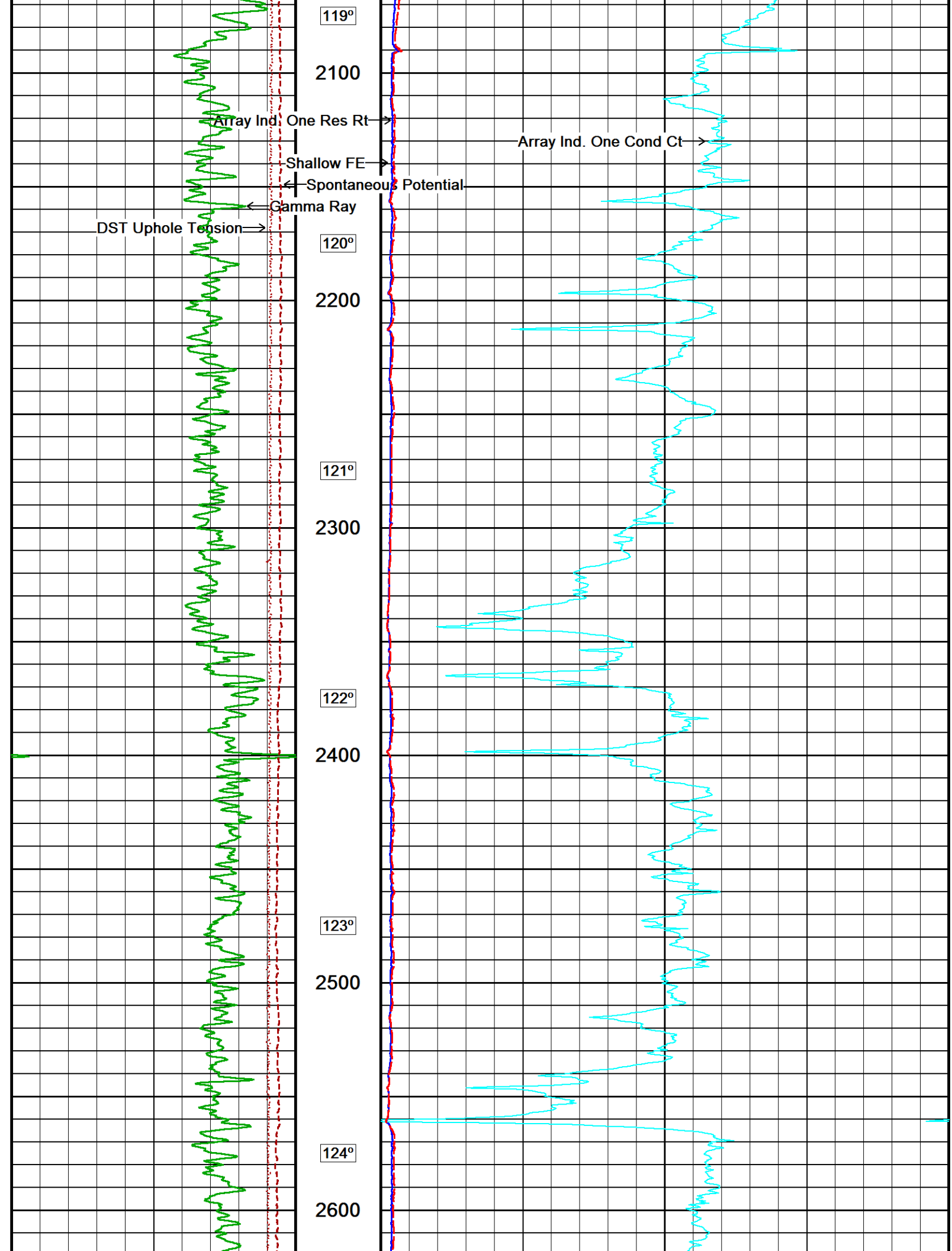
1600
116°
1700
116°
1800
117°
1900
118°
2000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2100
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Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
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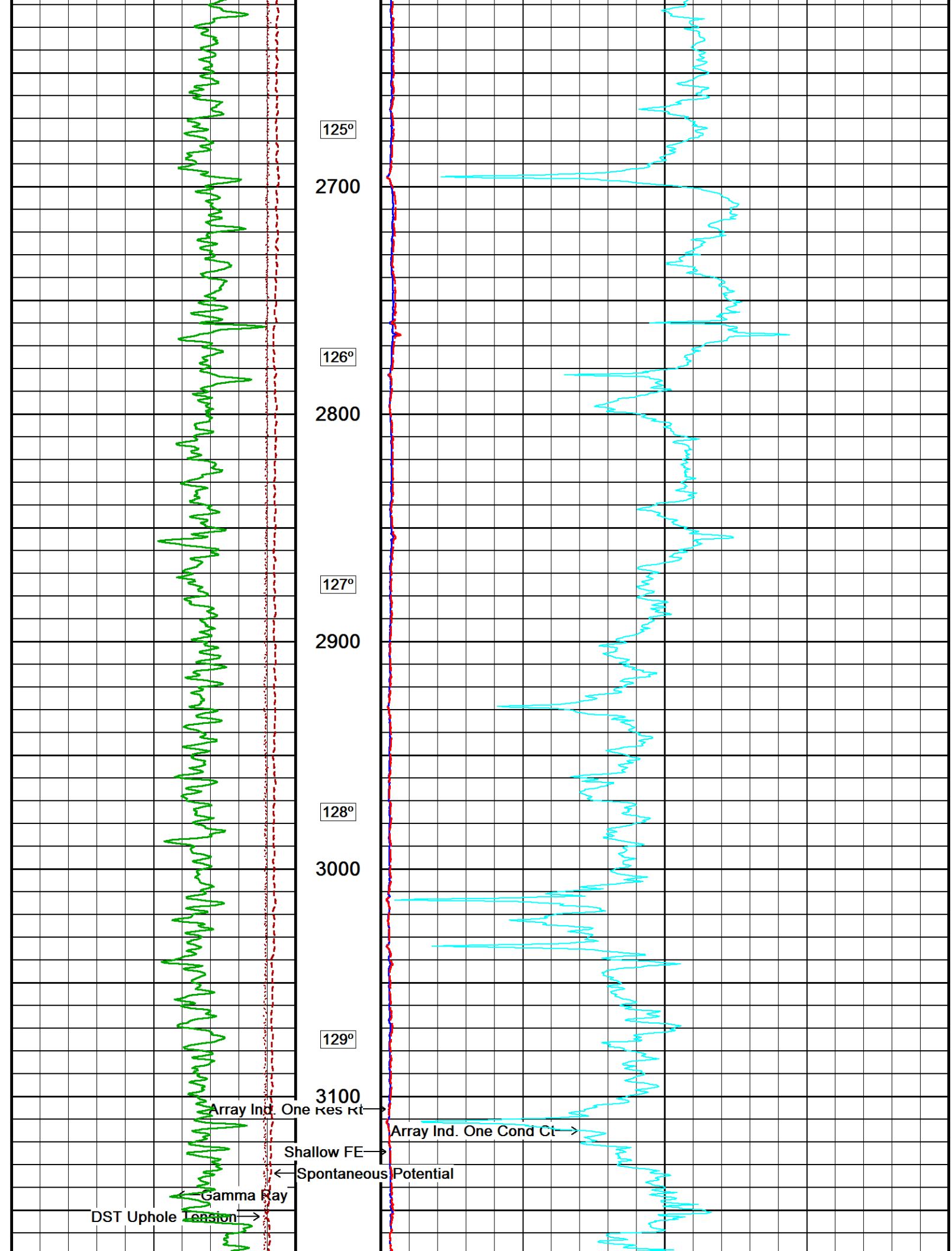
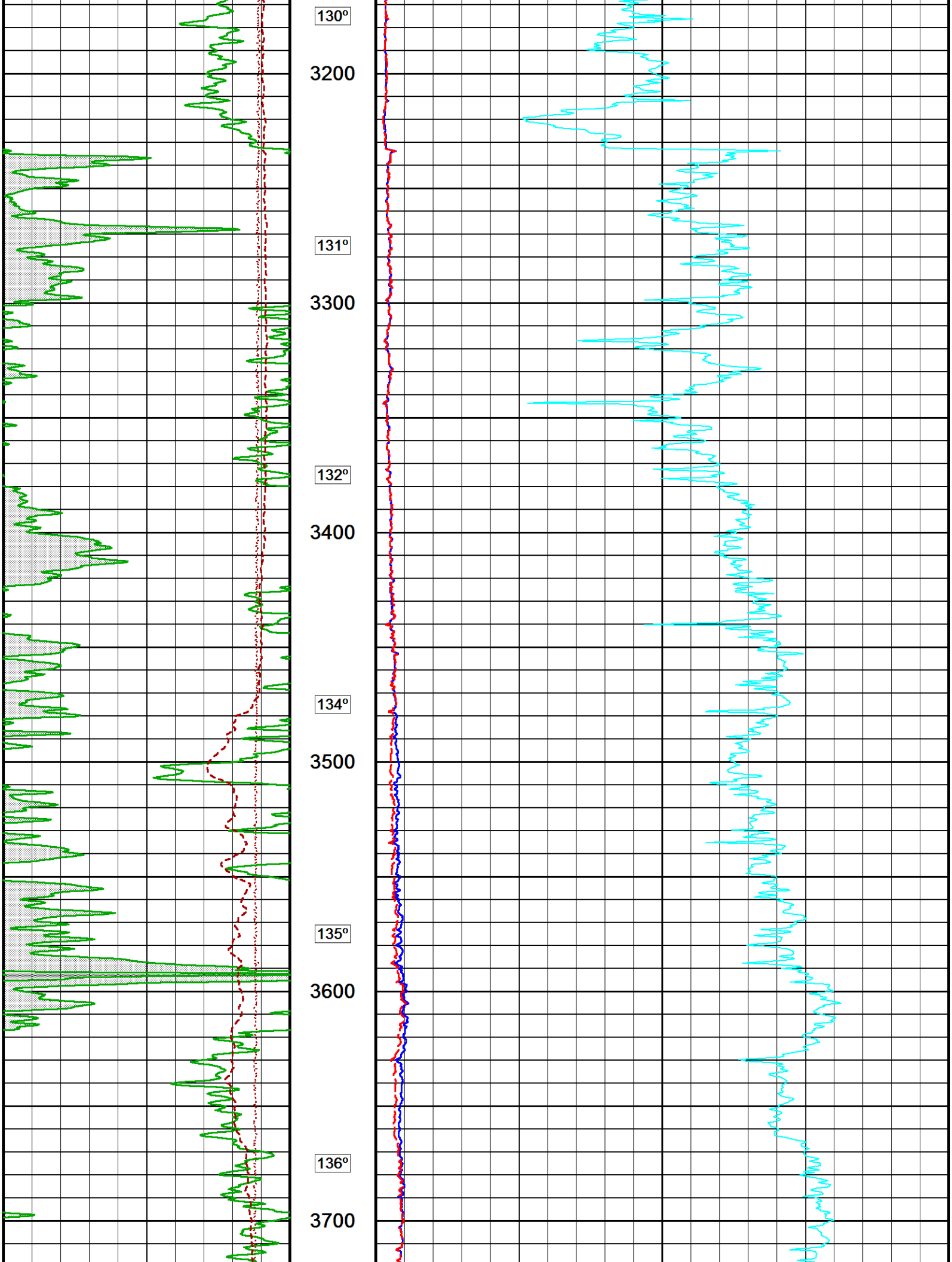
2300
122°
2400
123°
2500
124°
2600


125°
2700
126°
2800
127°
2900
128°
3000
129°
3100
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension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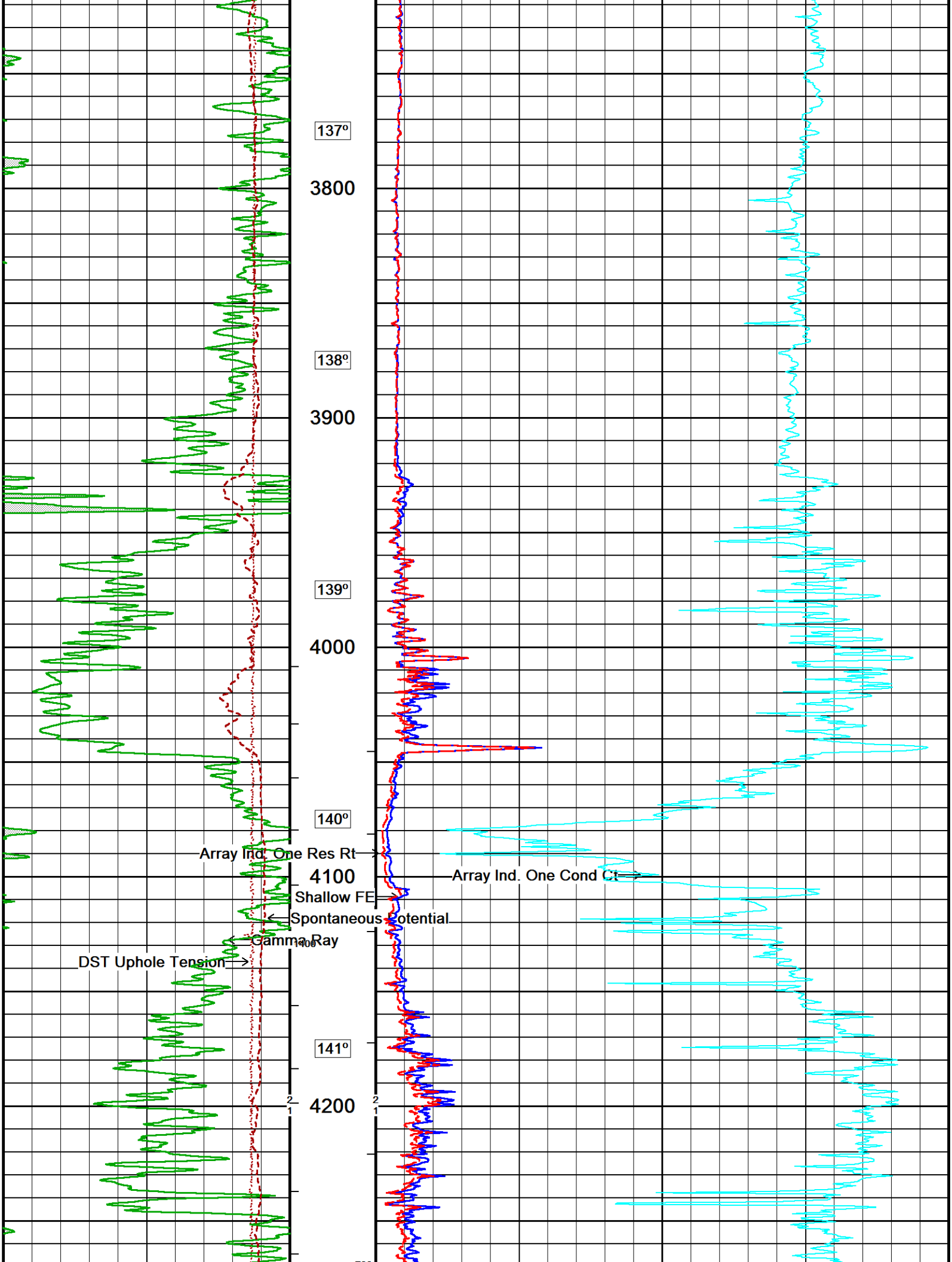
3300
132°
3400
134°
3500
135°
3600
136°
3700


137°
3800
138°
3900
139°
4000
140°
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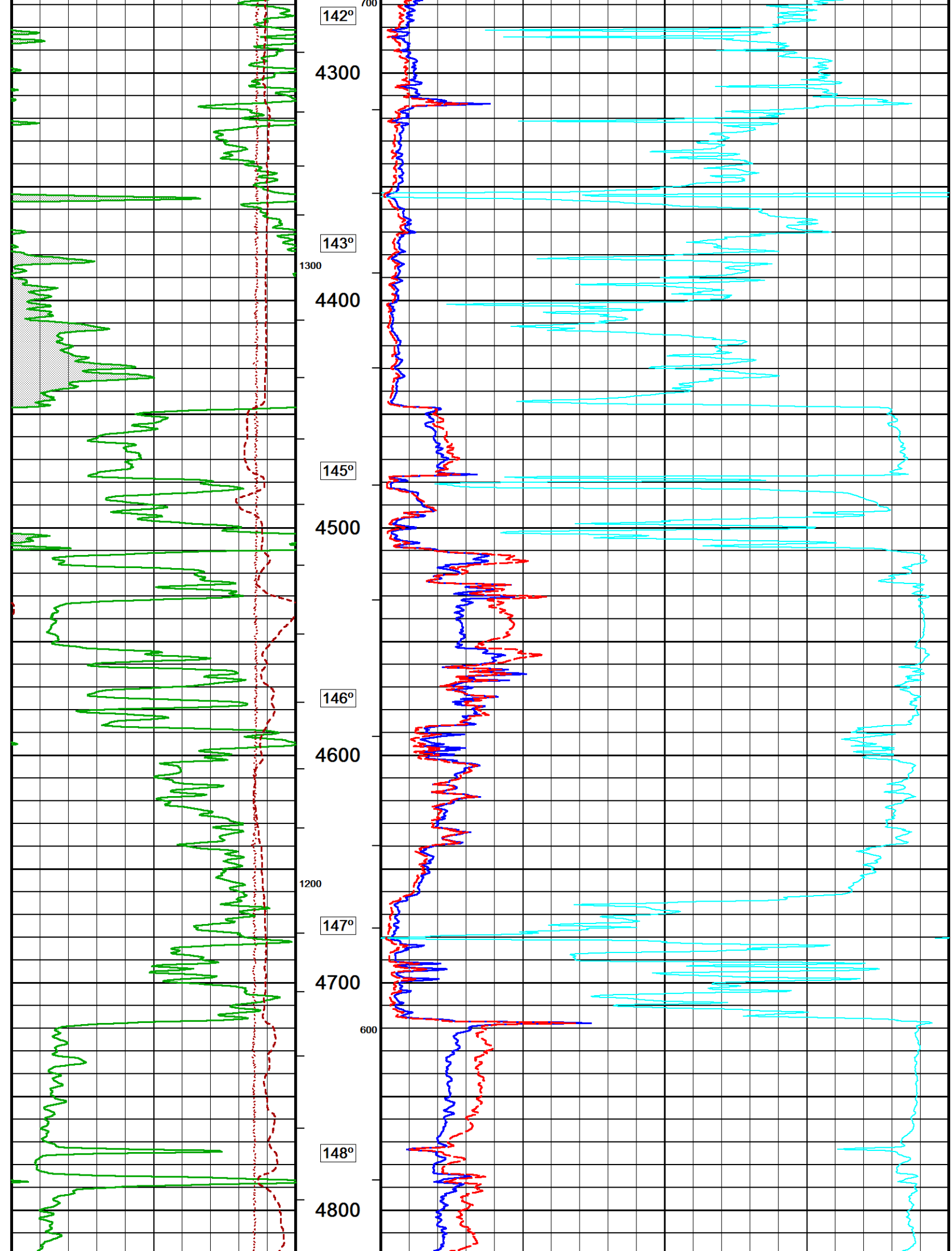
4100
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
1400
DST Uphole Tension
141°
4200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143°
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4400
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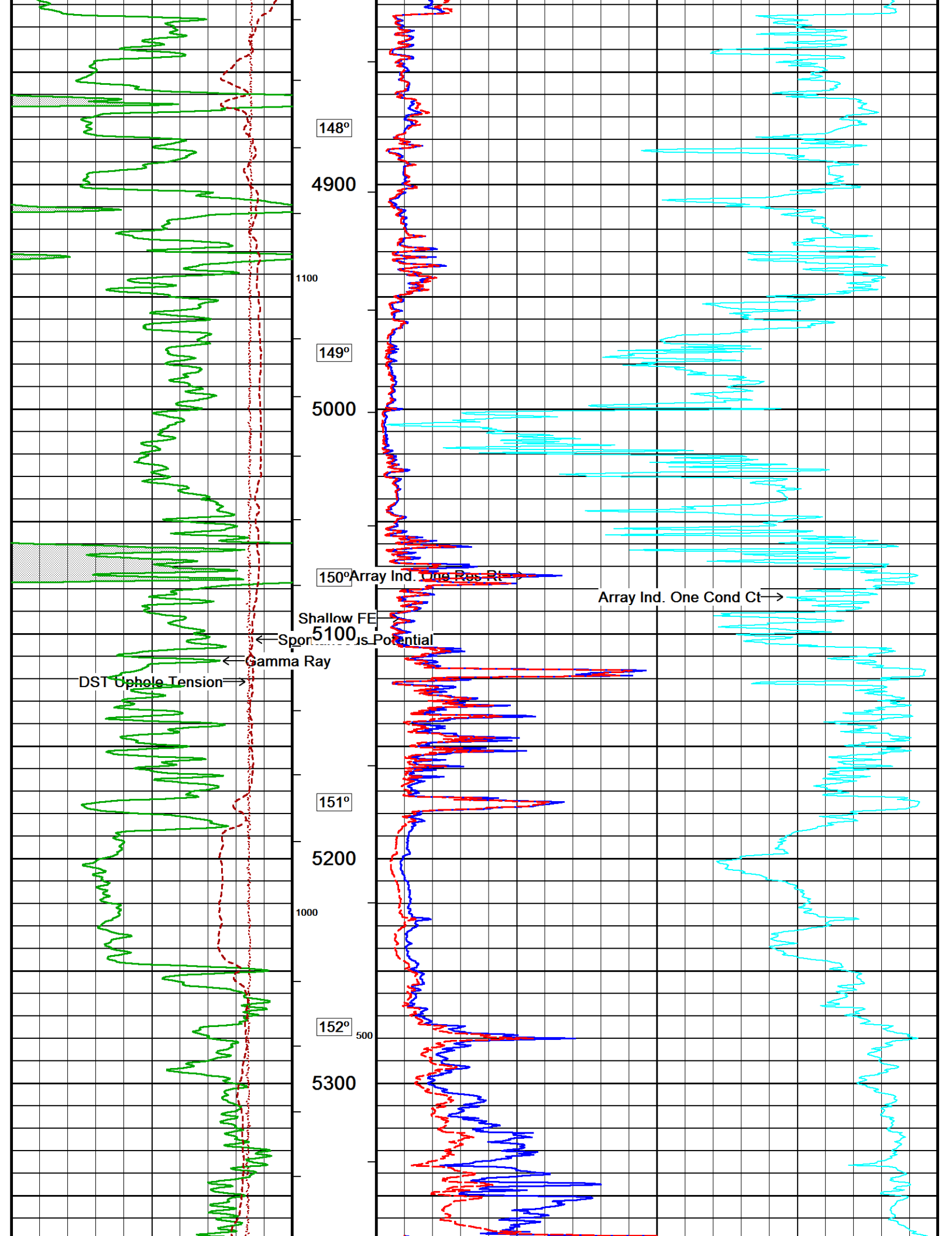
4500
146°
4600
1200
147°
4700
600
148°
4800


148°
4900
1100
149°
5000
150°
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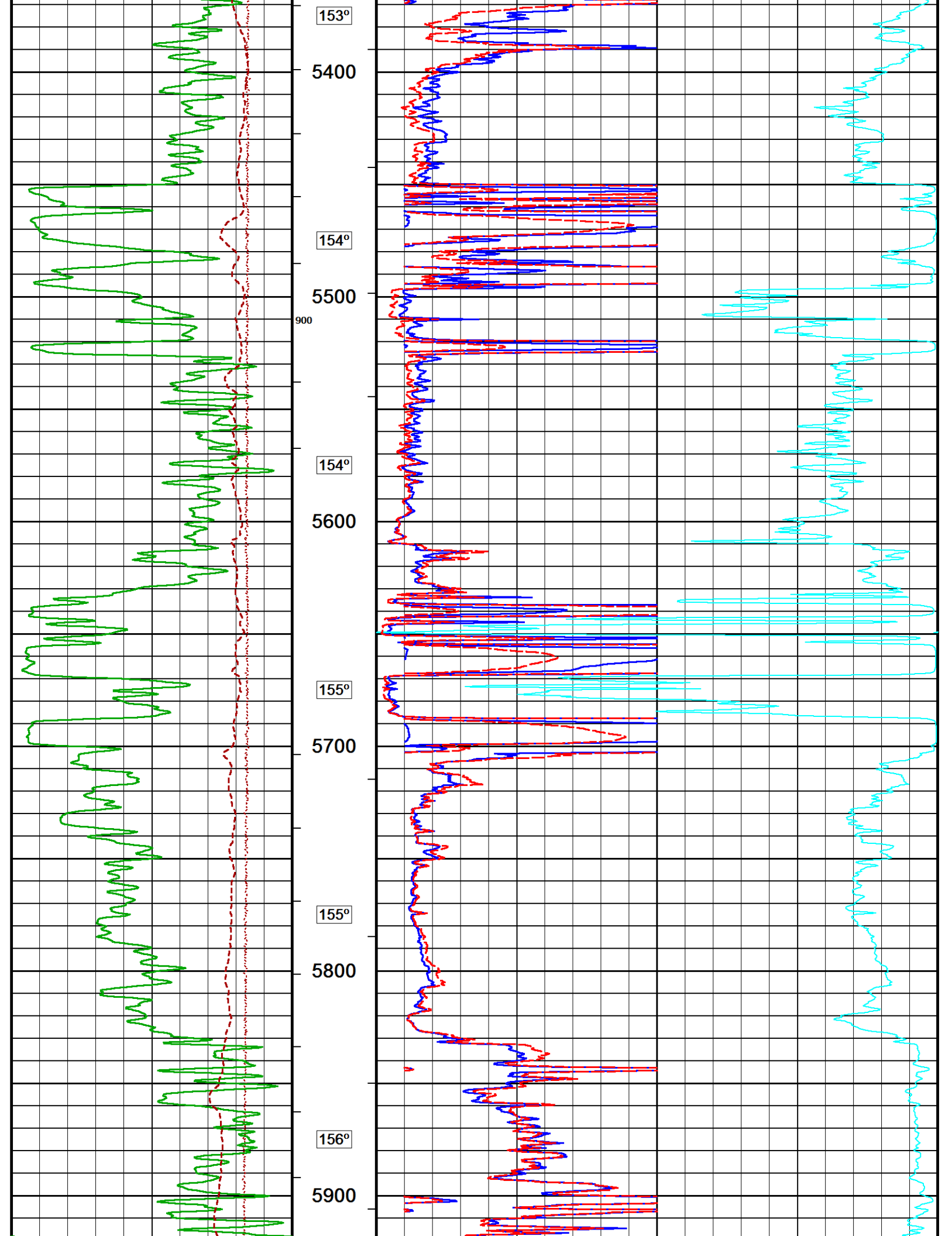
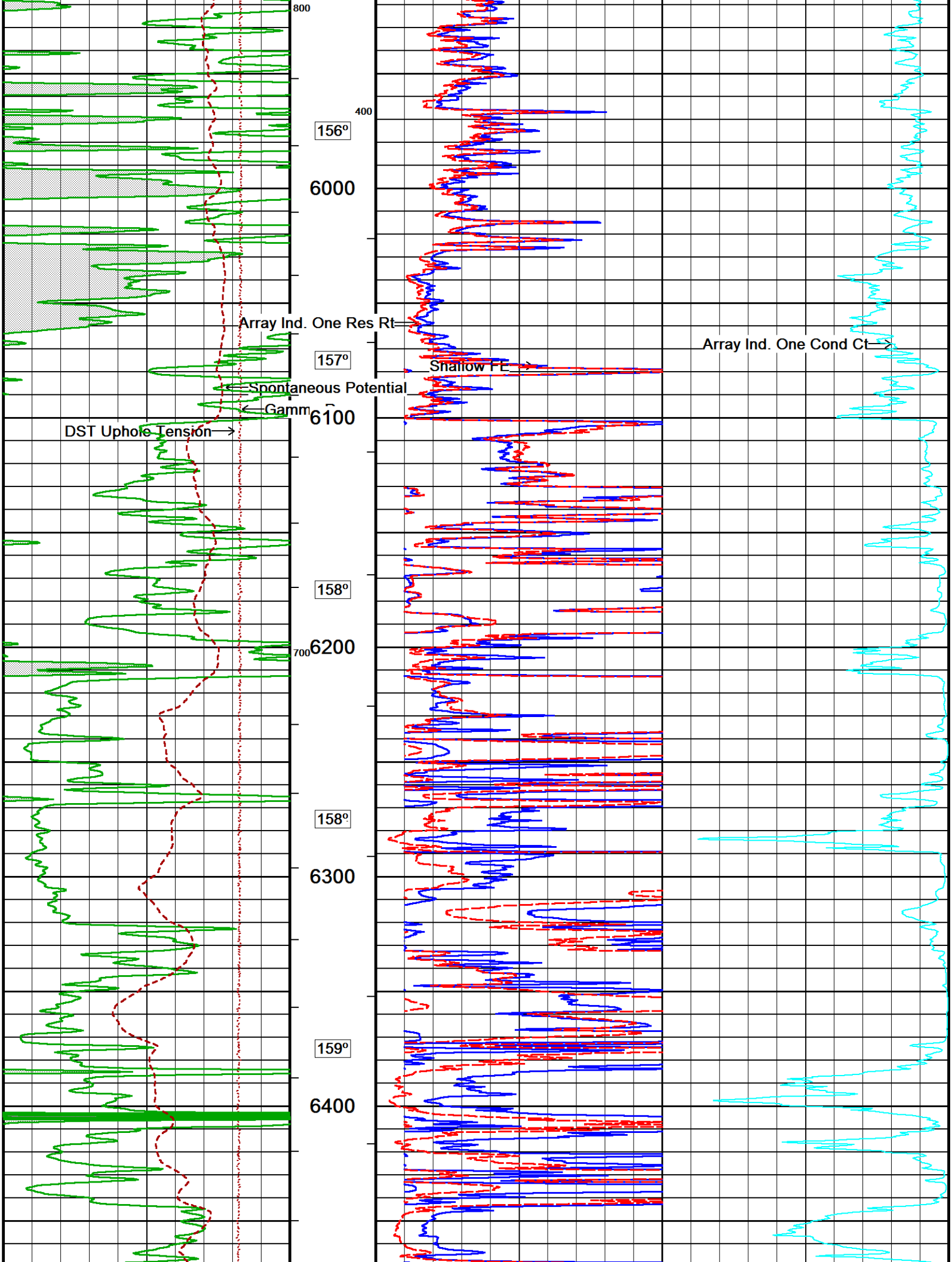
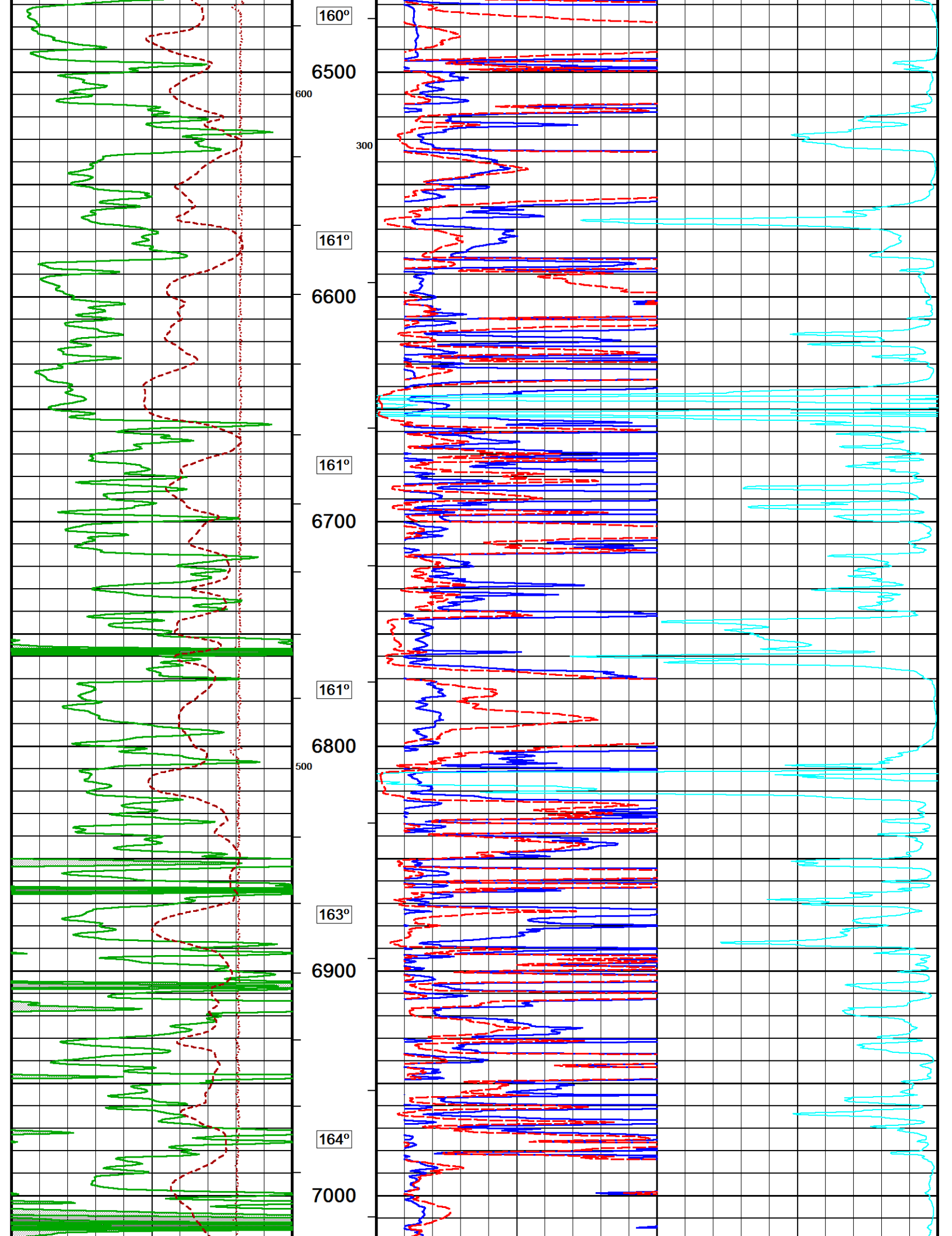
Array Ind. One Cond Ct
Shallow FE
5100
Spontaneous Potential
Gamma Ray
DST Uphole Tension
151°
5200
1000
152°
500
5300


153°
5400
154°
5500
900
154°
5600
155°
5700
155°
5800
156°
5900


800
400
156°
6000
Array Ind. One Res Rt
157°
Shallow FE
Array Ind. One Cond Ct
Spontaneous Potential
Gamm
6100
DST Uphole Tension
158°
700
6200
158°
6300
159°
6400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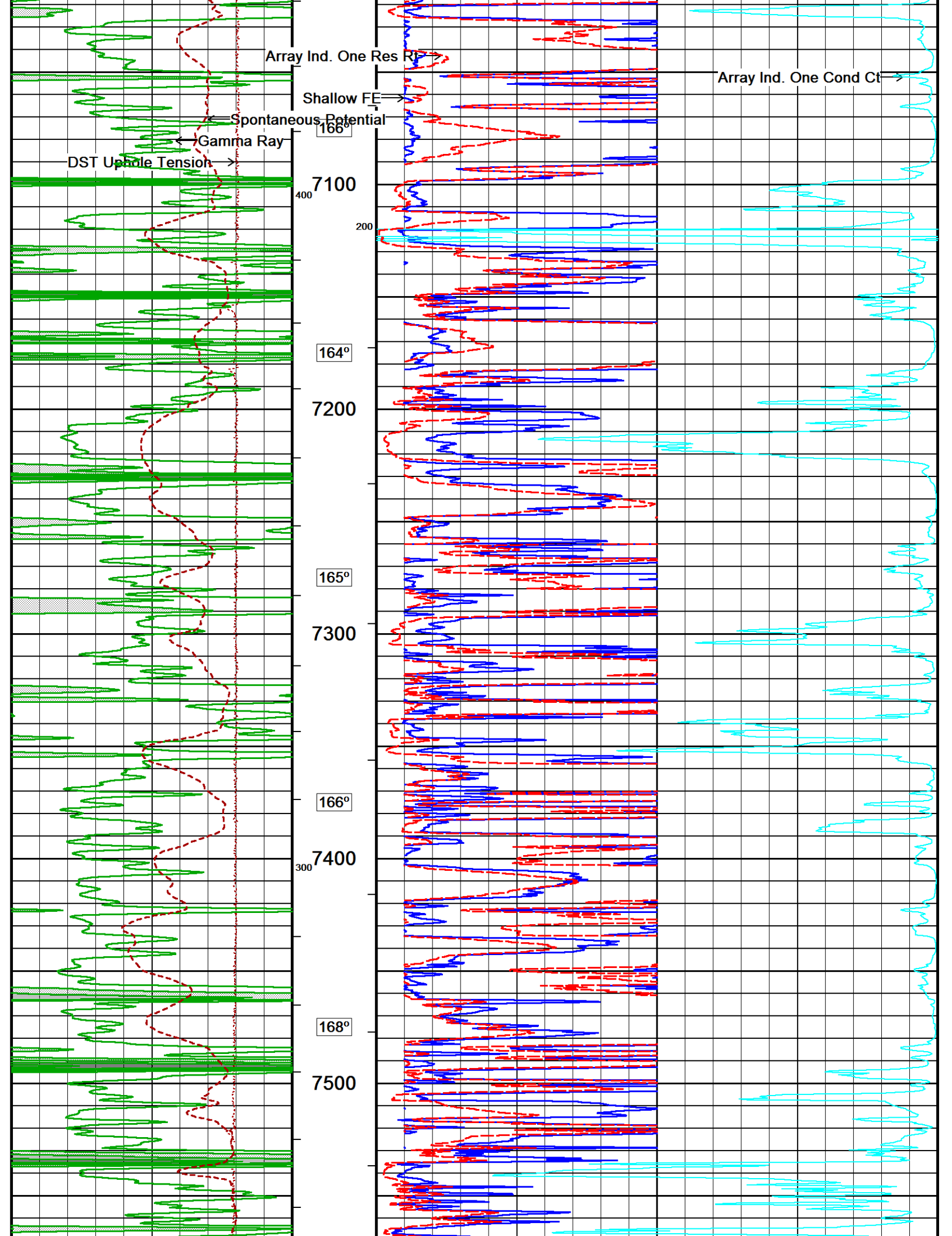
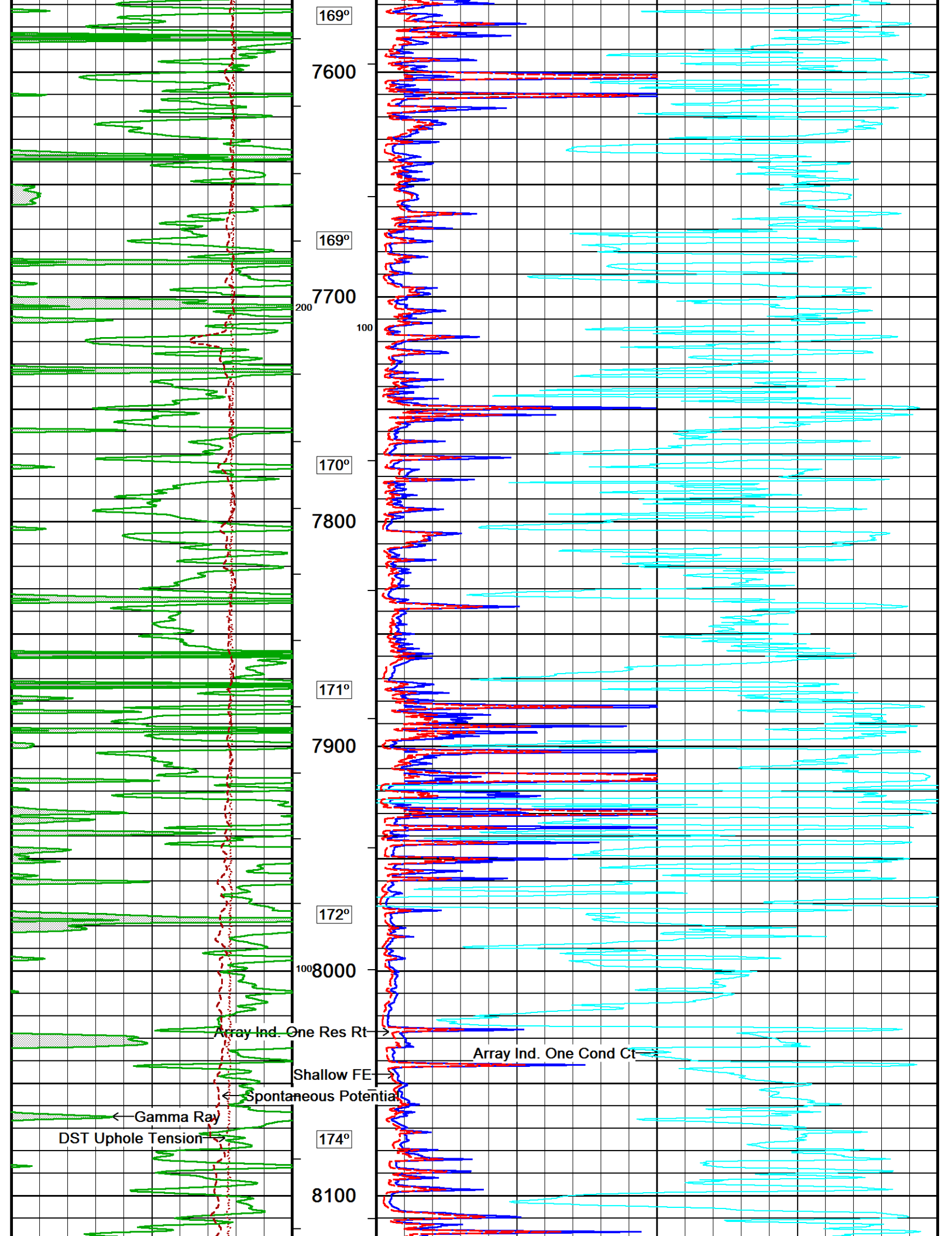
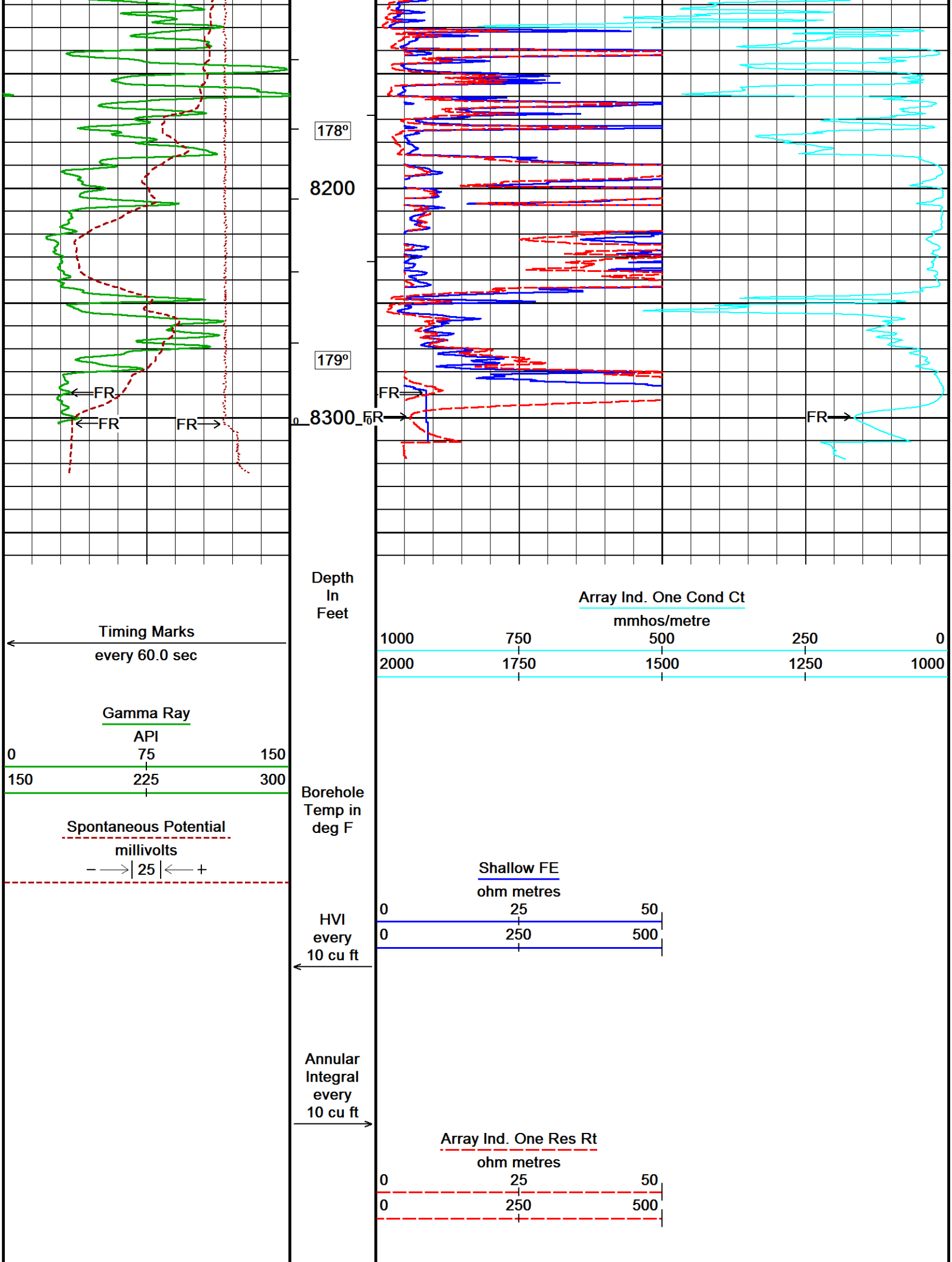
6500
600
300
161°
6600
161°
6700
161°
6800
500
163°
6900
164°
7000


Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
166°
164°
165°
166°
168°
400
300
200
7100
7200
7300
7400
7500


169°
7600
169°
7700
200
100
170°
7800
171°
7900
172°
100
8000
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
174°
8100


178°
8200
179°
8300
FR
FR
FR
FR
FR
Depth
In
Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Spontaneous Potential
millivolts
– 25 +
Borehole
Temp in
deg F
HVI
every
10 cu ft
Annular
Integral
every
10 cu ft
Array Ind. One Cond Ct
mmhos/metre
1000
750
500
250
0
2000
1750
1500
1250
1000
Shallow FE
ohm metres
0
25
50
0
250
500
Array Ind. One Res Rt
ohm metres
0
25
50
0
250
500

DST Uphole Tension
pounds
5000 0

Replay Scale 1:600

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 18.03.9344\Data\Murfin Moonraker #6-27\MERGED MAIN PASS final.dta
System Versions: Plotted with 18.03.9344

Plotted on 20-JAN-2019 14:06
Recorded on 20-JAN-2019 03:03

2 INCH MAIN

5 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 18.03.9344\Data\Murfin Moonraker #6-27\MERGED MAIN PASS final.dta
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Plotted on 20-JAN-2019 14:06
Recorded on 20-JAN-2019 03:03

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
– → | 25 | ← +

Depth In Feet

Borehole Temp in deg F

HVI every 10 cu ft

Annular Integral every 10 cu ft

Shallow FE
ohm metres
0.20 1 10 100 1000 2000

Array Ind. One Res 40
ohm metres
0.20 1 10 100 1000 2000

Array Ind. One Res 60
ohm metres
0.20 1 10 100 1000 2000

Array Ind. One Res Rt
ohm metres
0.20 1 10 100 1000 2000

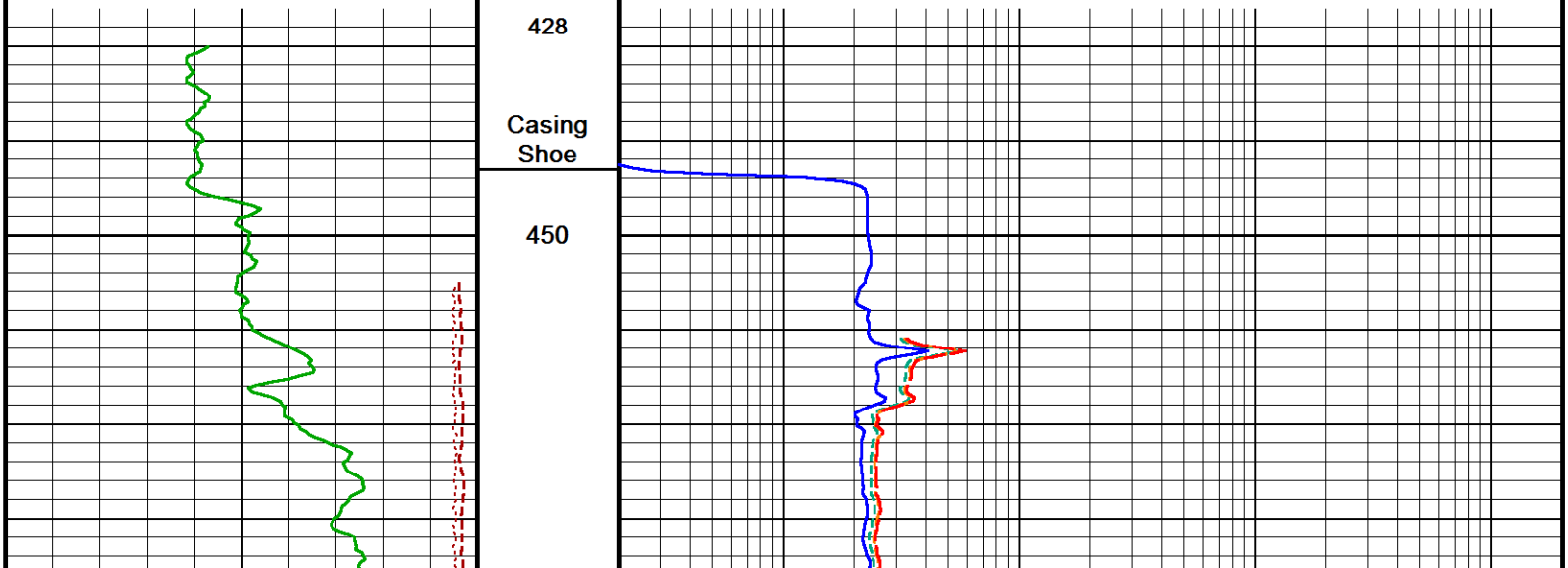
DST Uphole Tension
pounds
5000 0

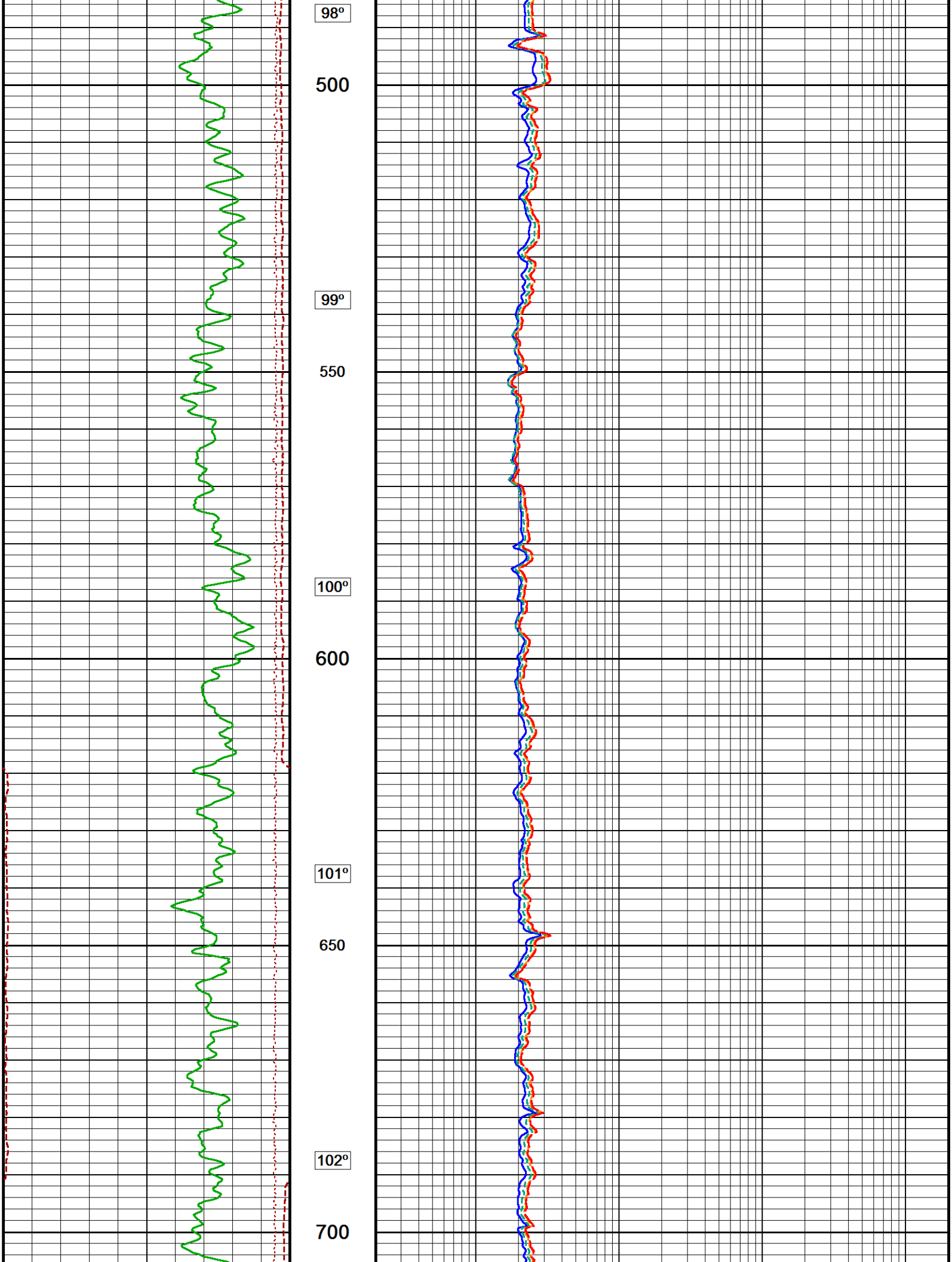
Replay Scale 1:240

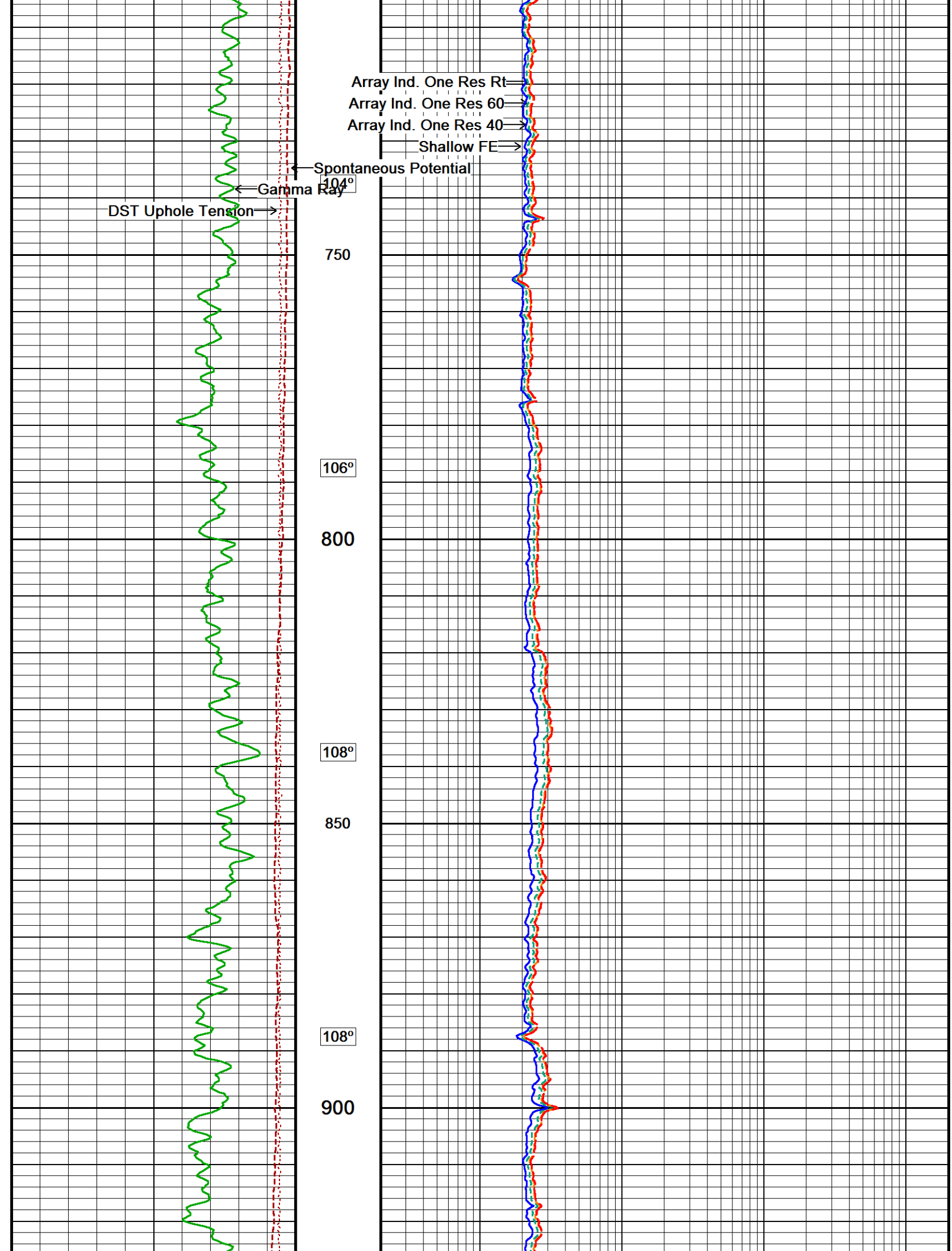
428

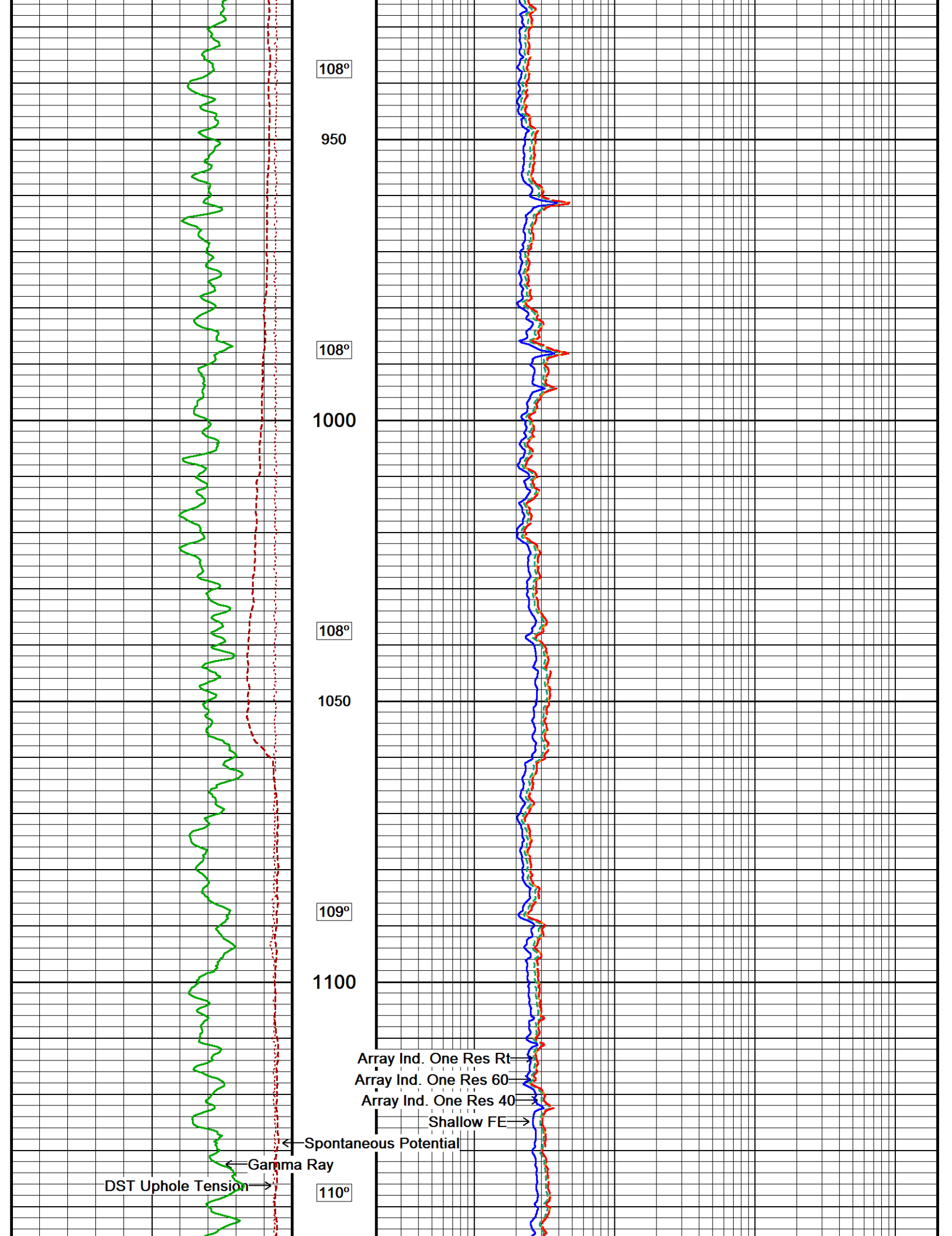
Casing Shoe

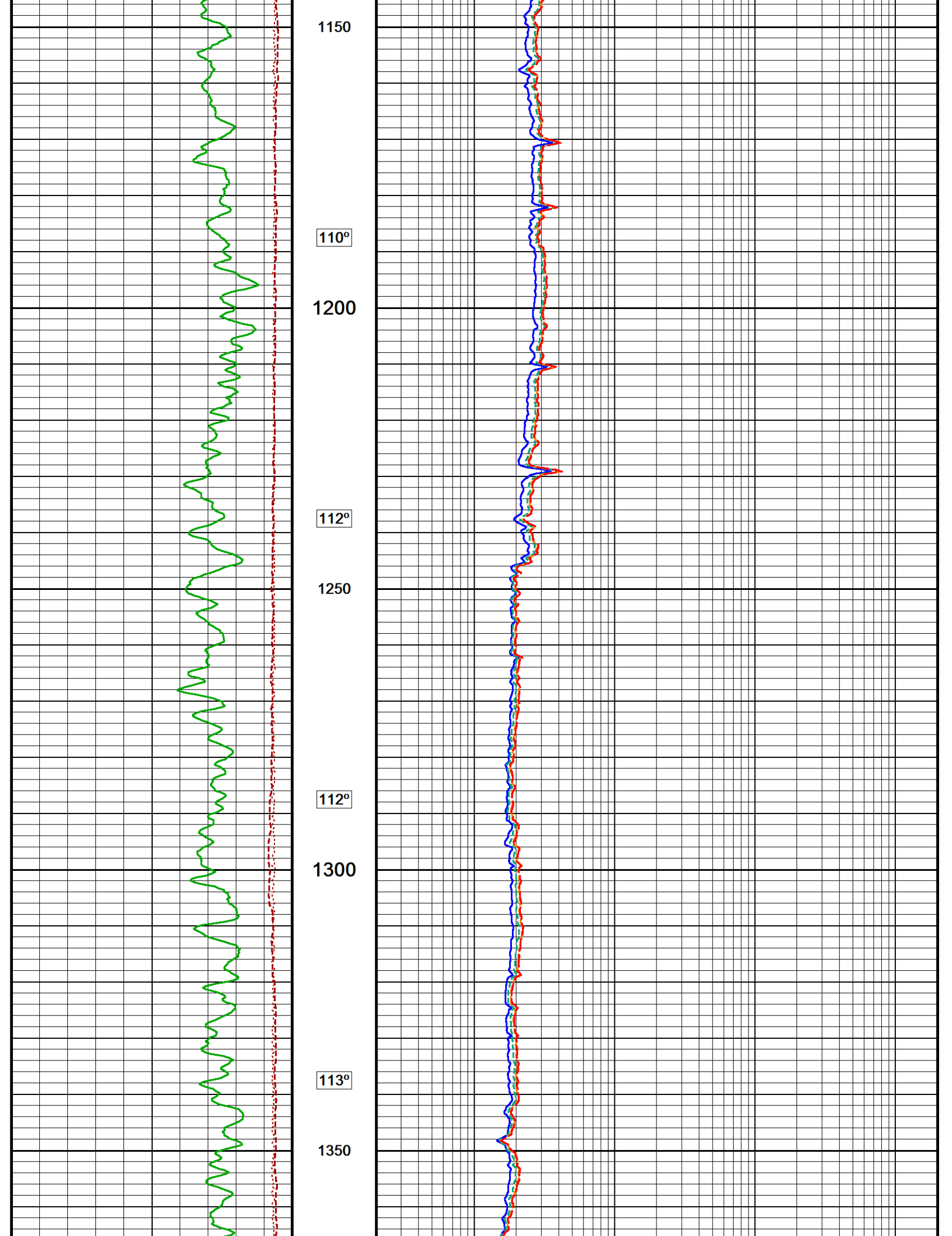
450

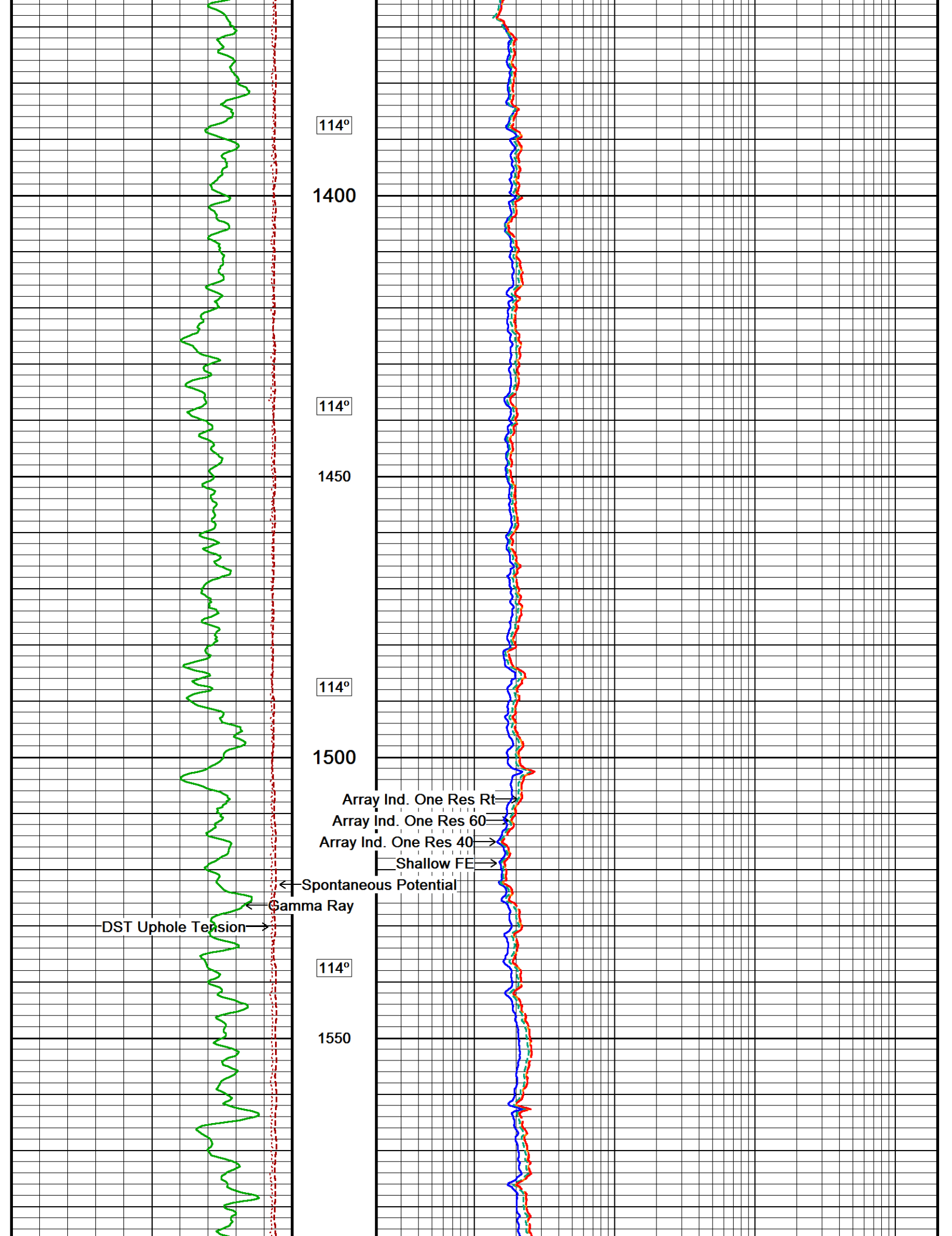



98°
500
99°
550
100°
600
101°
650
102°
700


Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
104°
Gamma Ray
DST Uphole Tension
750
106°
800
108°
850
108°
900


108º
950
108º
1000
108º
1050
109º
1100
110º
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension


1150
110°
1200
112°
1250
112°
1300
113°
1350


114°
1400
114°
1450
114°
1500
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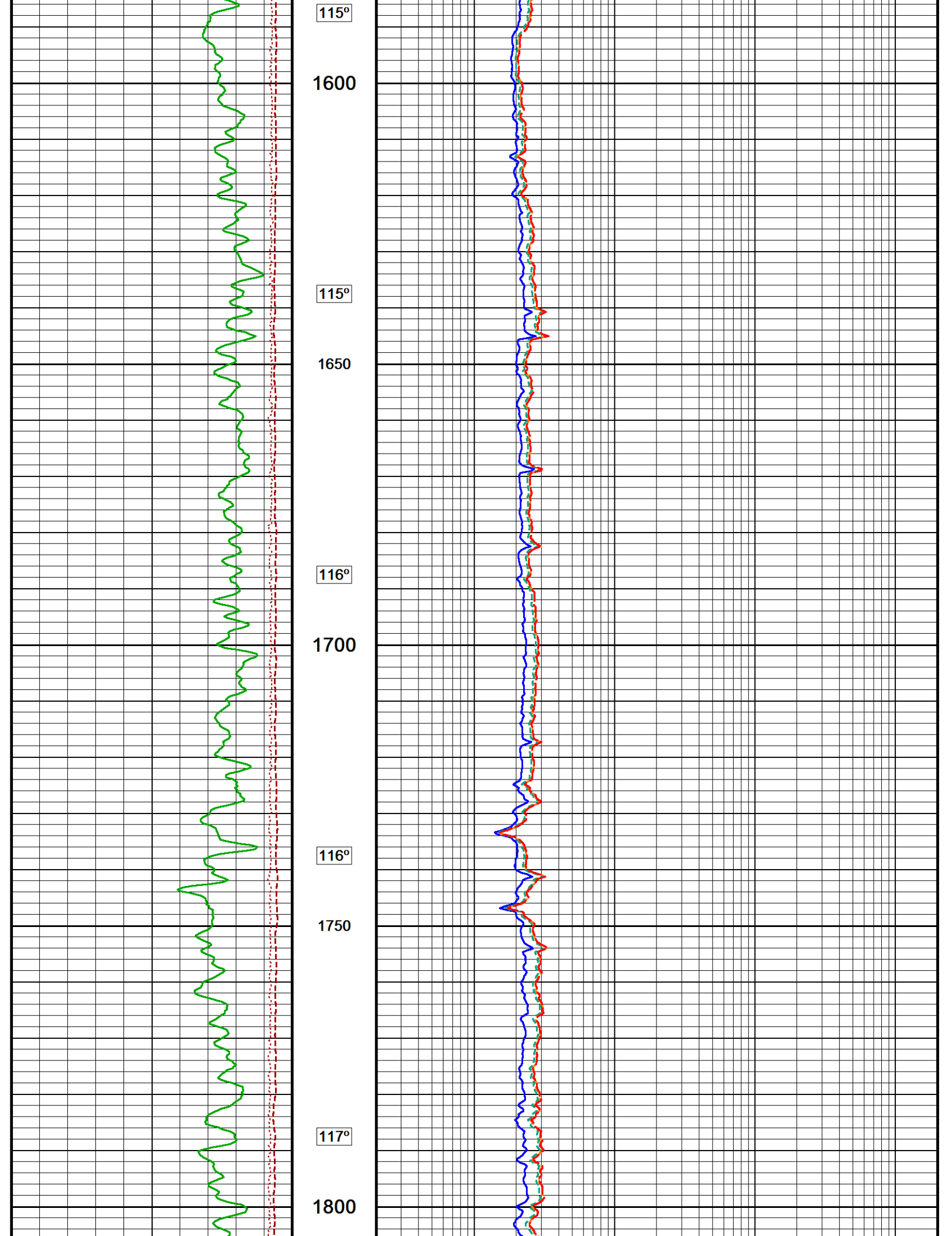
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
114°
1550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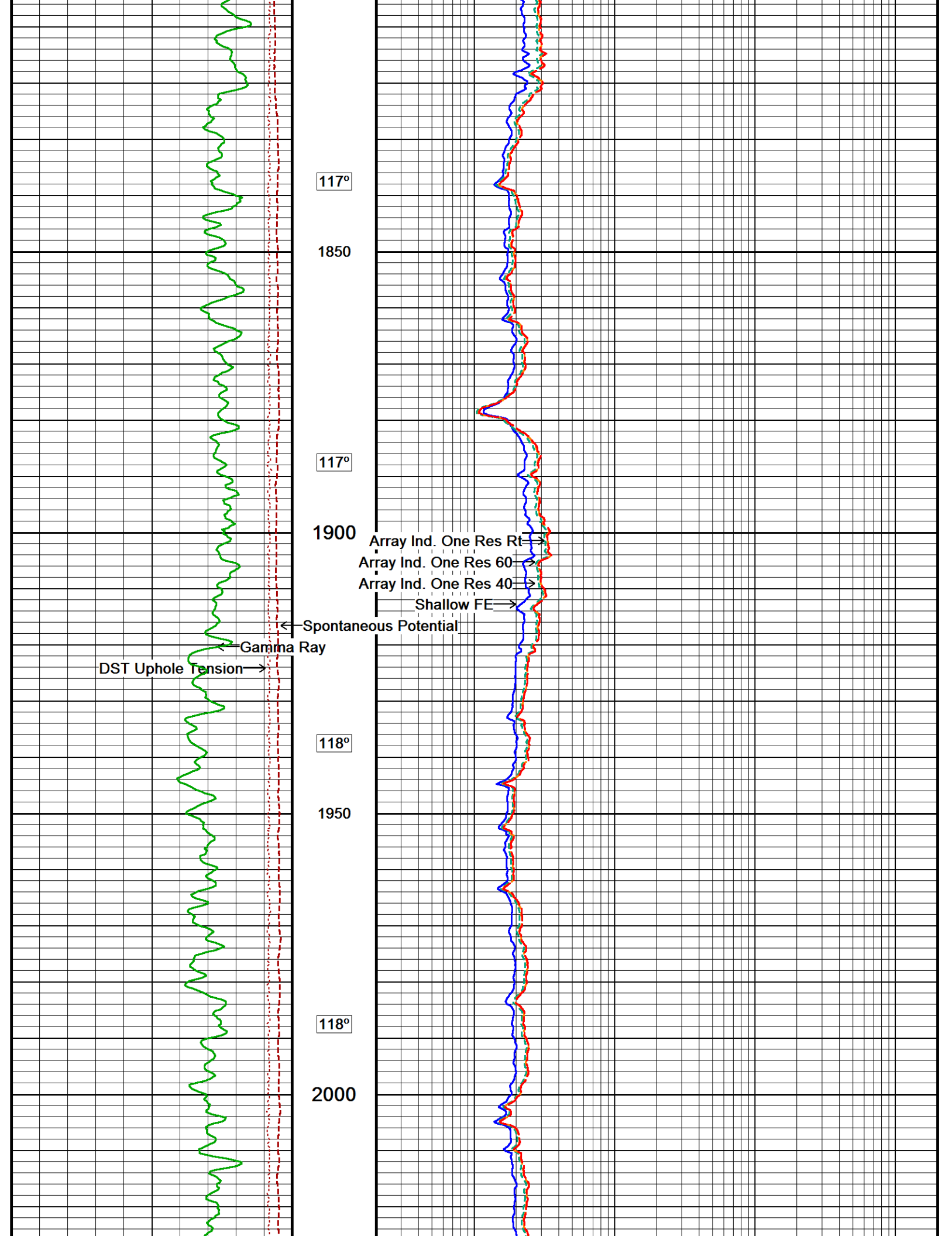
115°
1650
116°
1700
116°
1750
117°
1800


117°
1850
117°
1900
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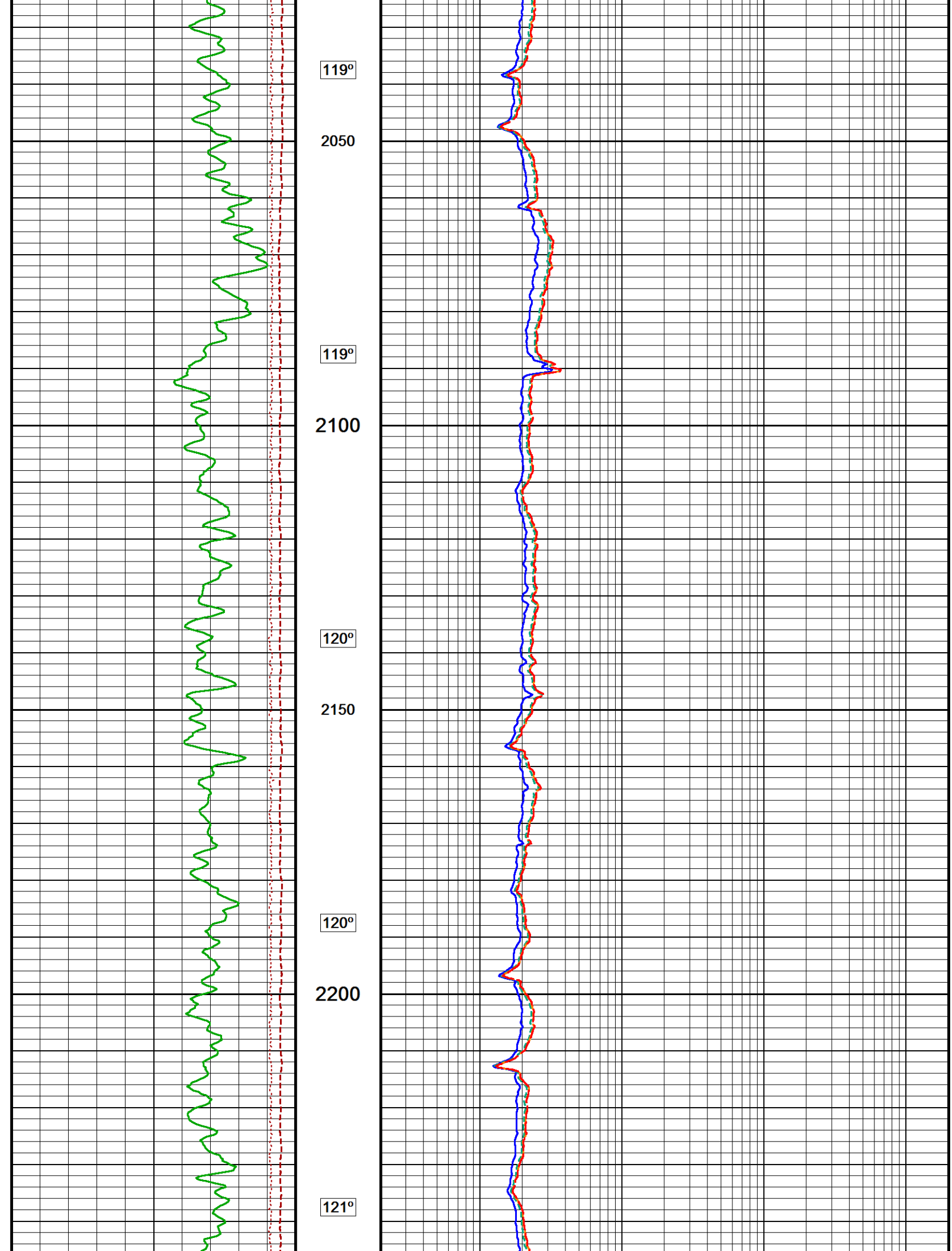
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
118°
1950
118°
2000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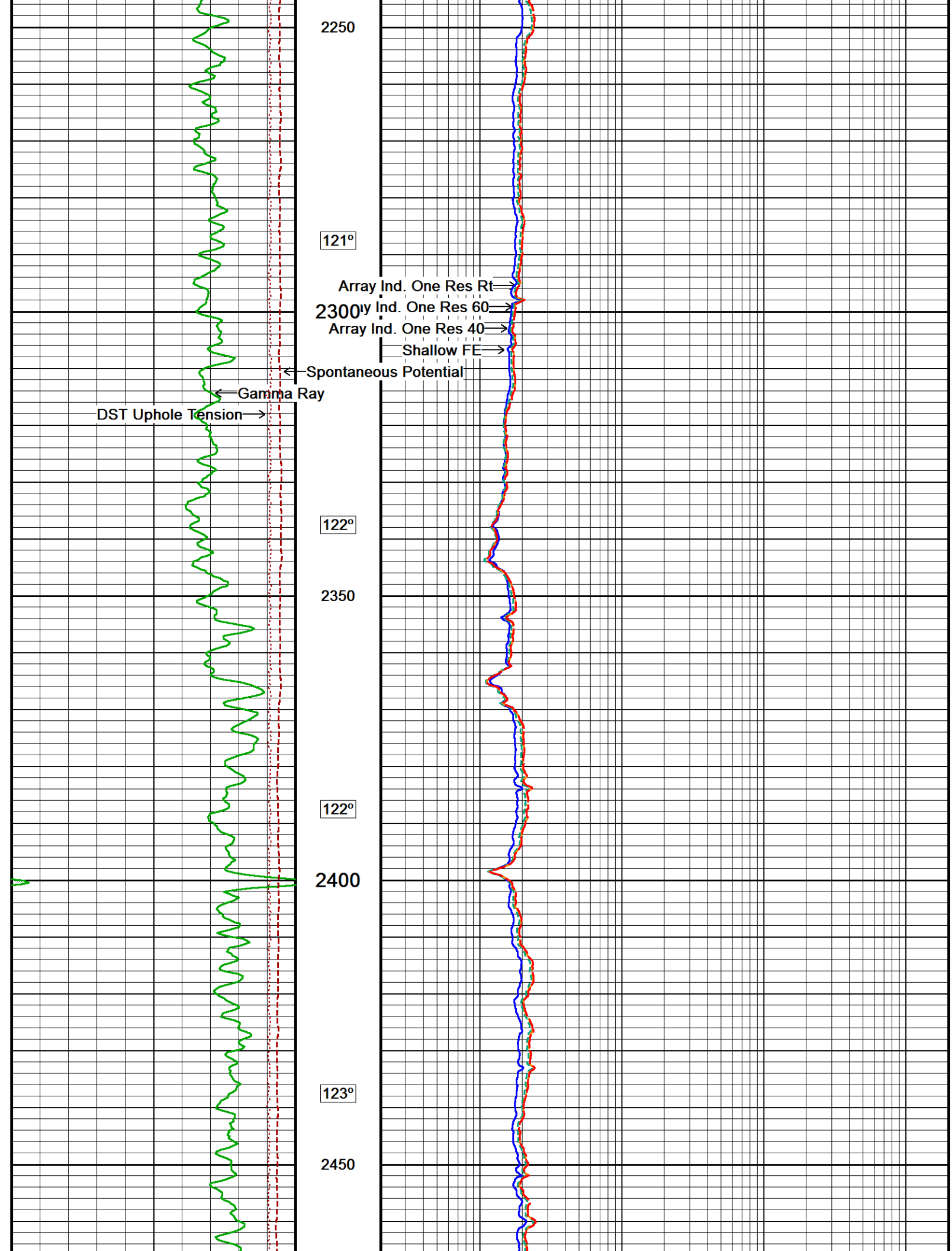
2050
119º
2100
120º
2150
120º
2200
121º


2250
121°
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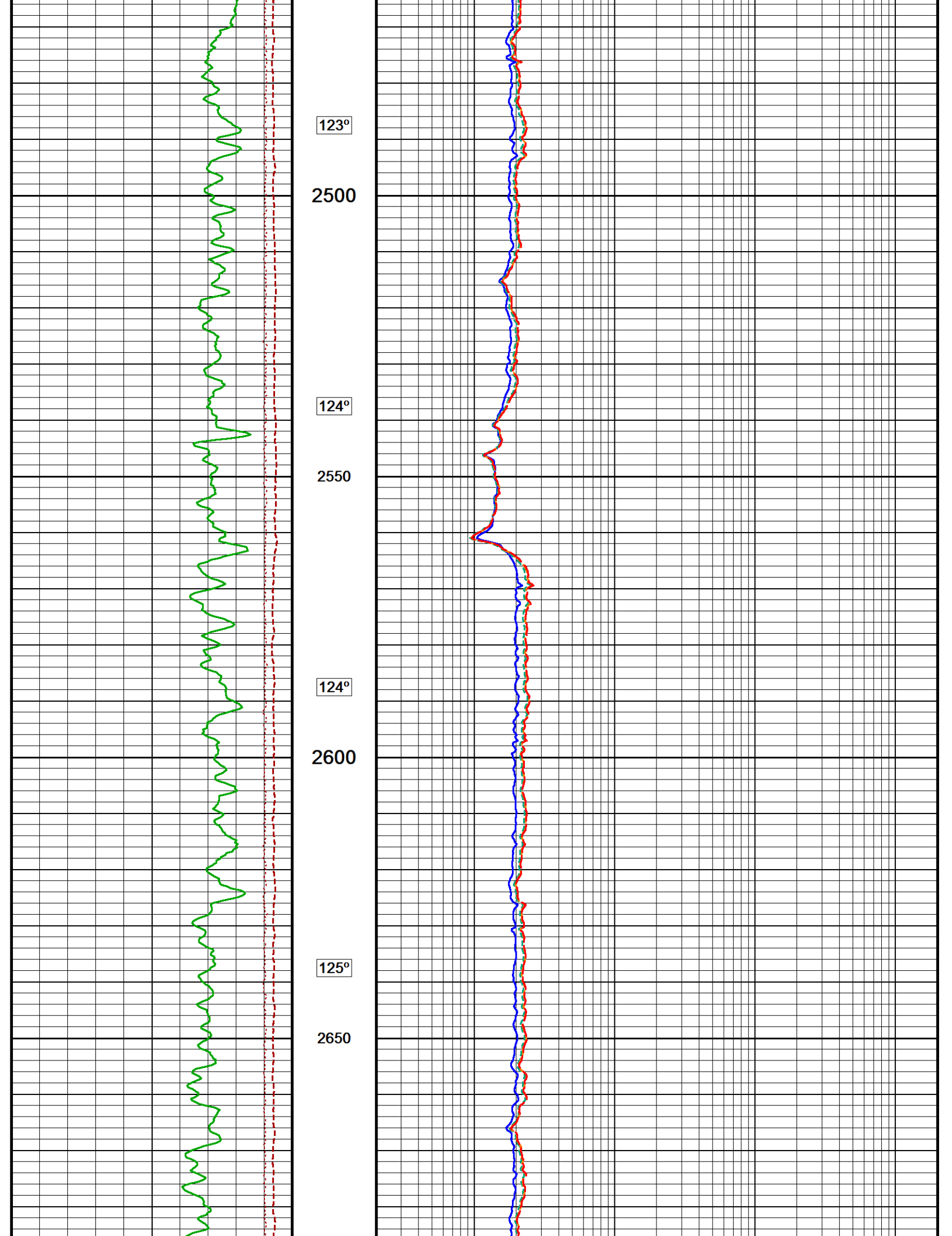
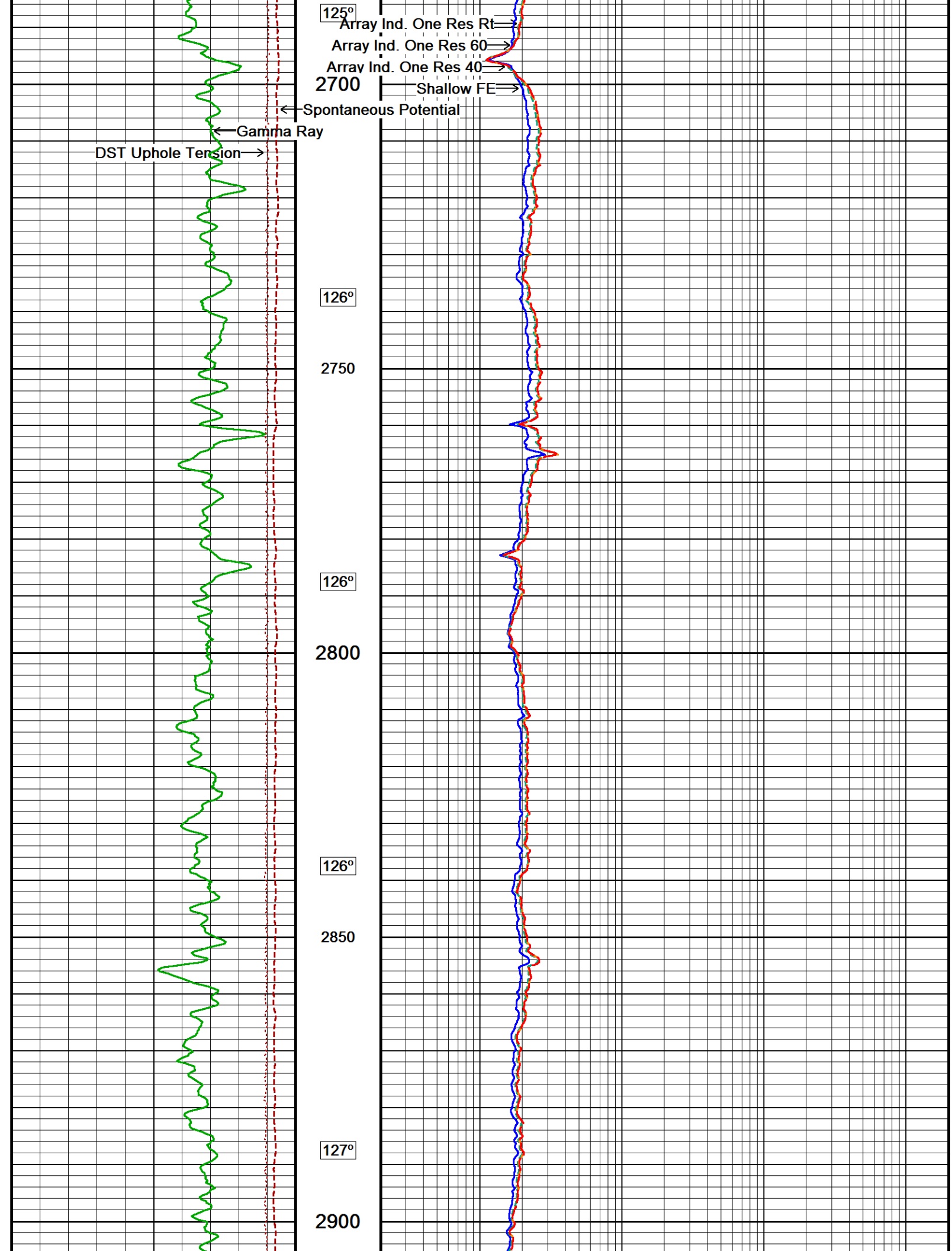
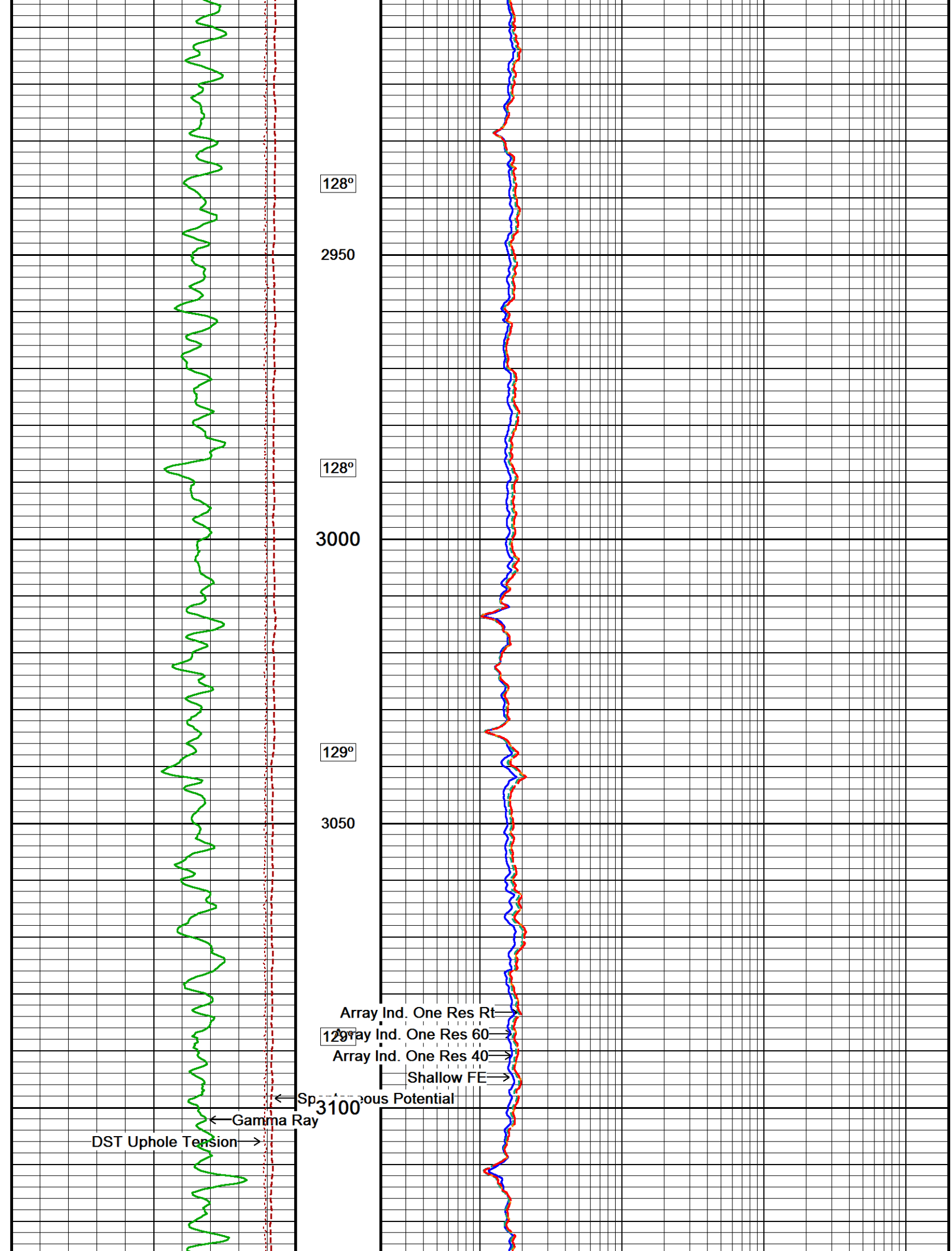
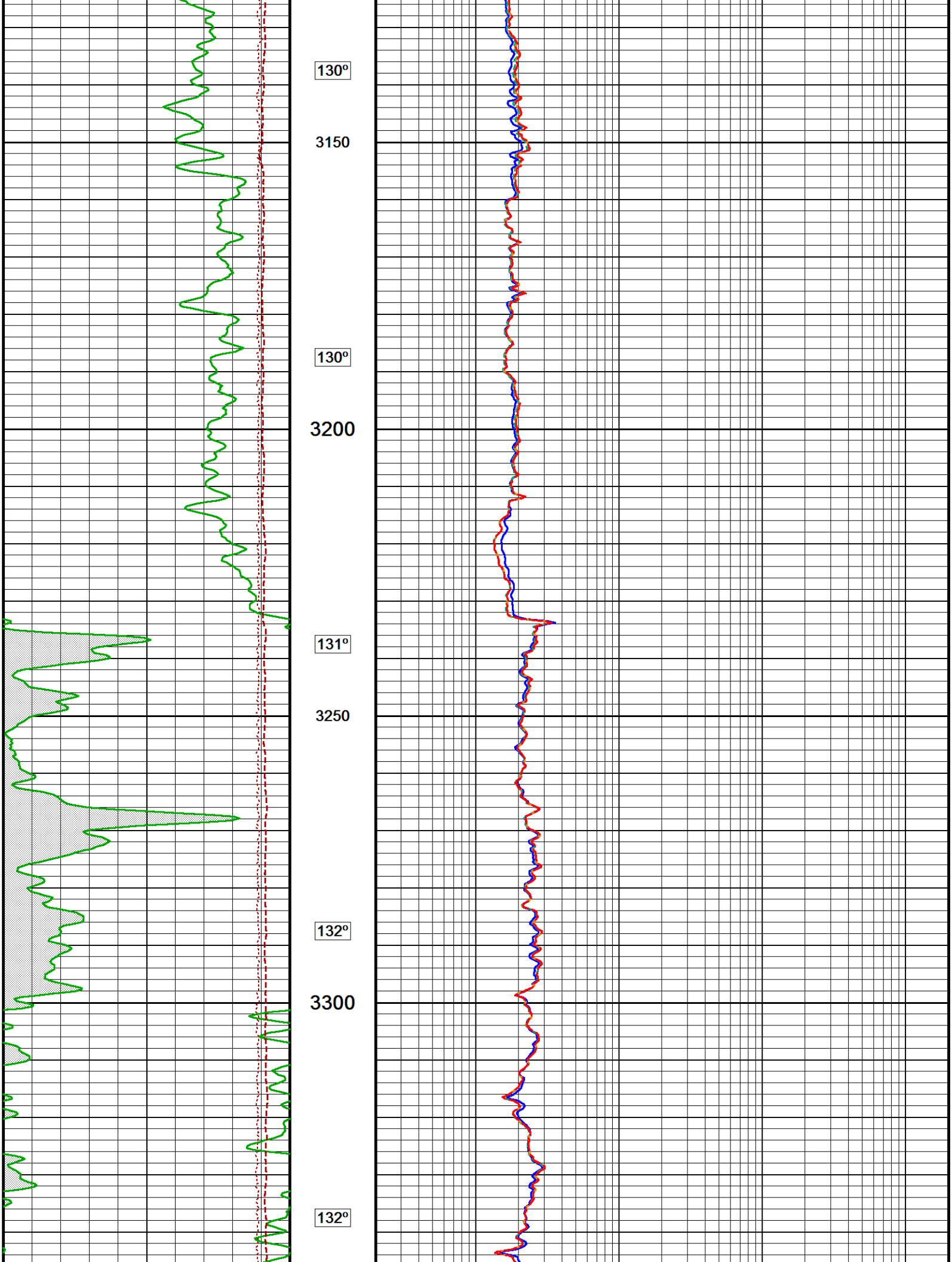
2300
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
122°
2350
122°
2400
123°
2450


123°
2500
124°
2550
124°
2600
125°
2650


125°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
2700
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
126°
2750
126°
2800
126°
2850
127°
2900


128°
2950
128°
3000
129°
3050
129°
3100
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension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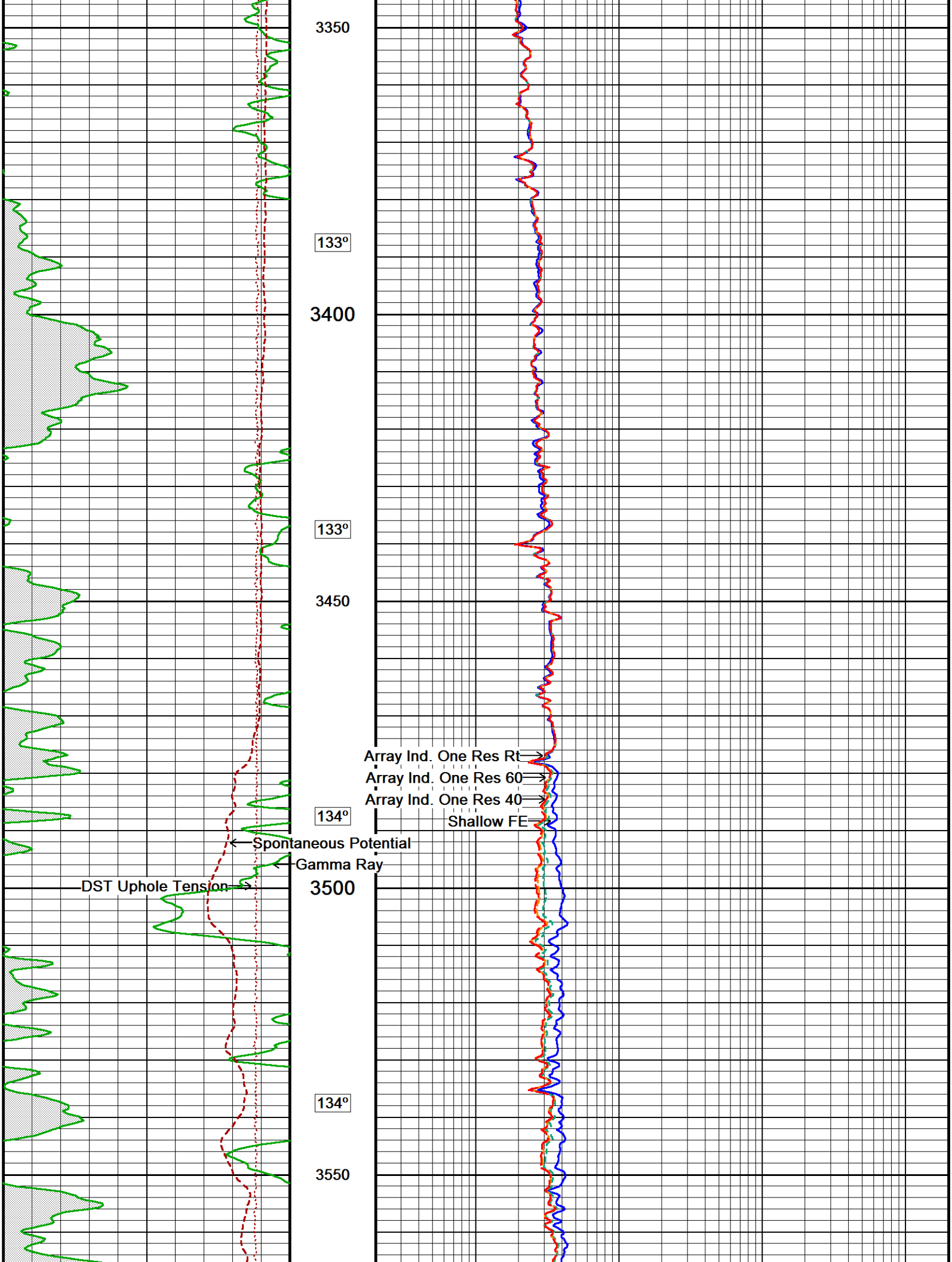
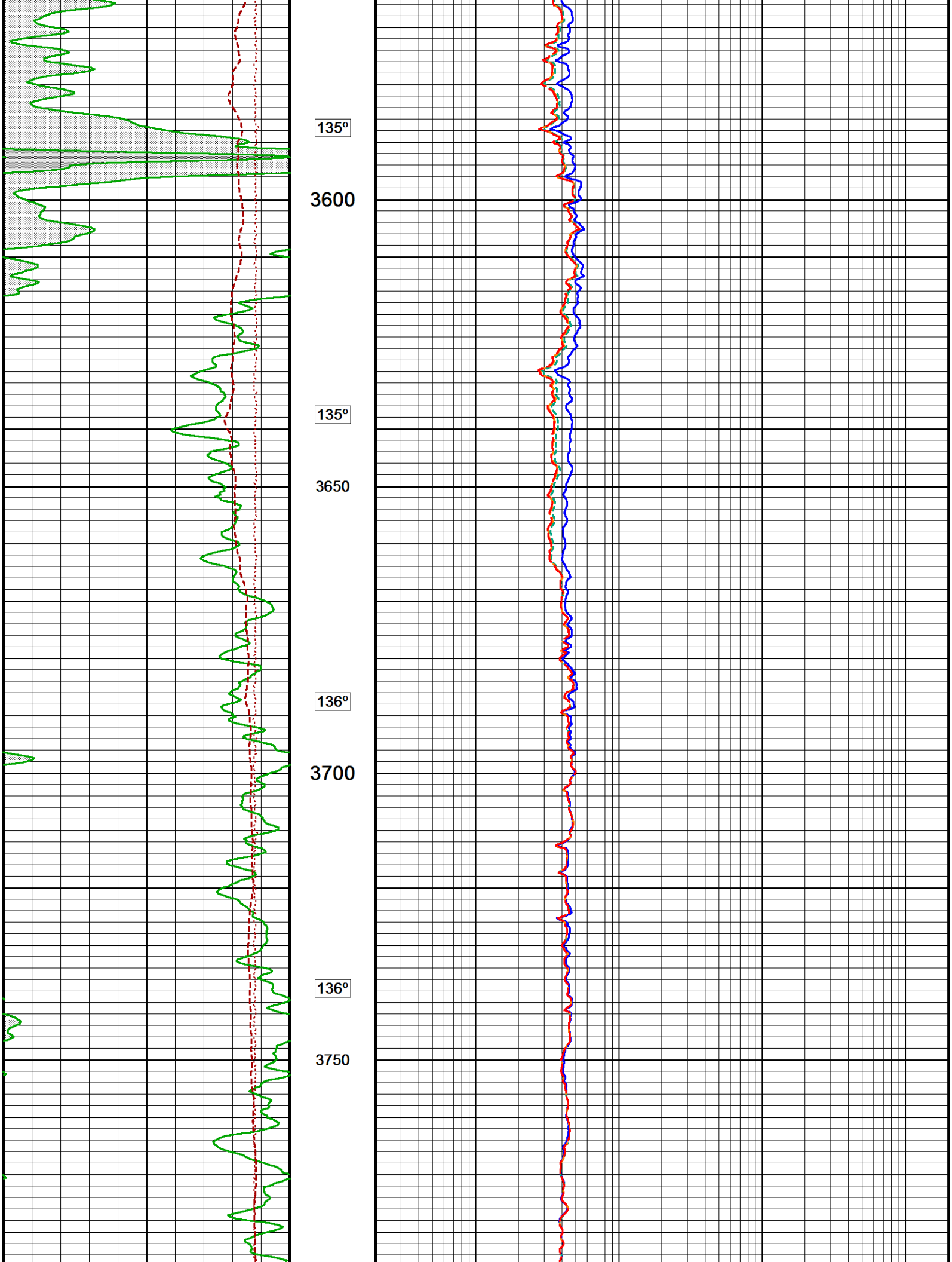
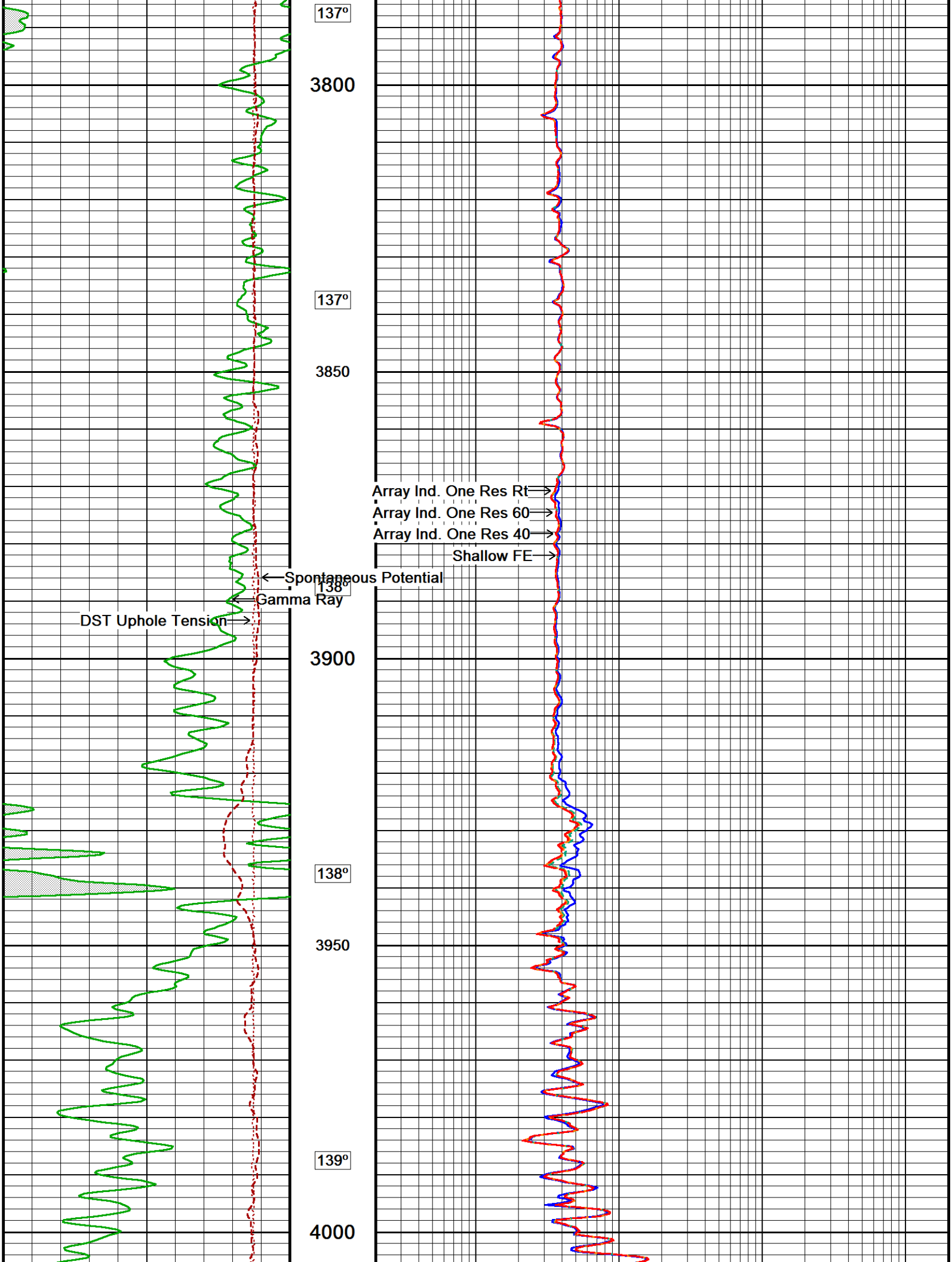
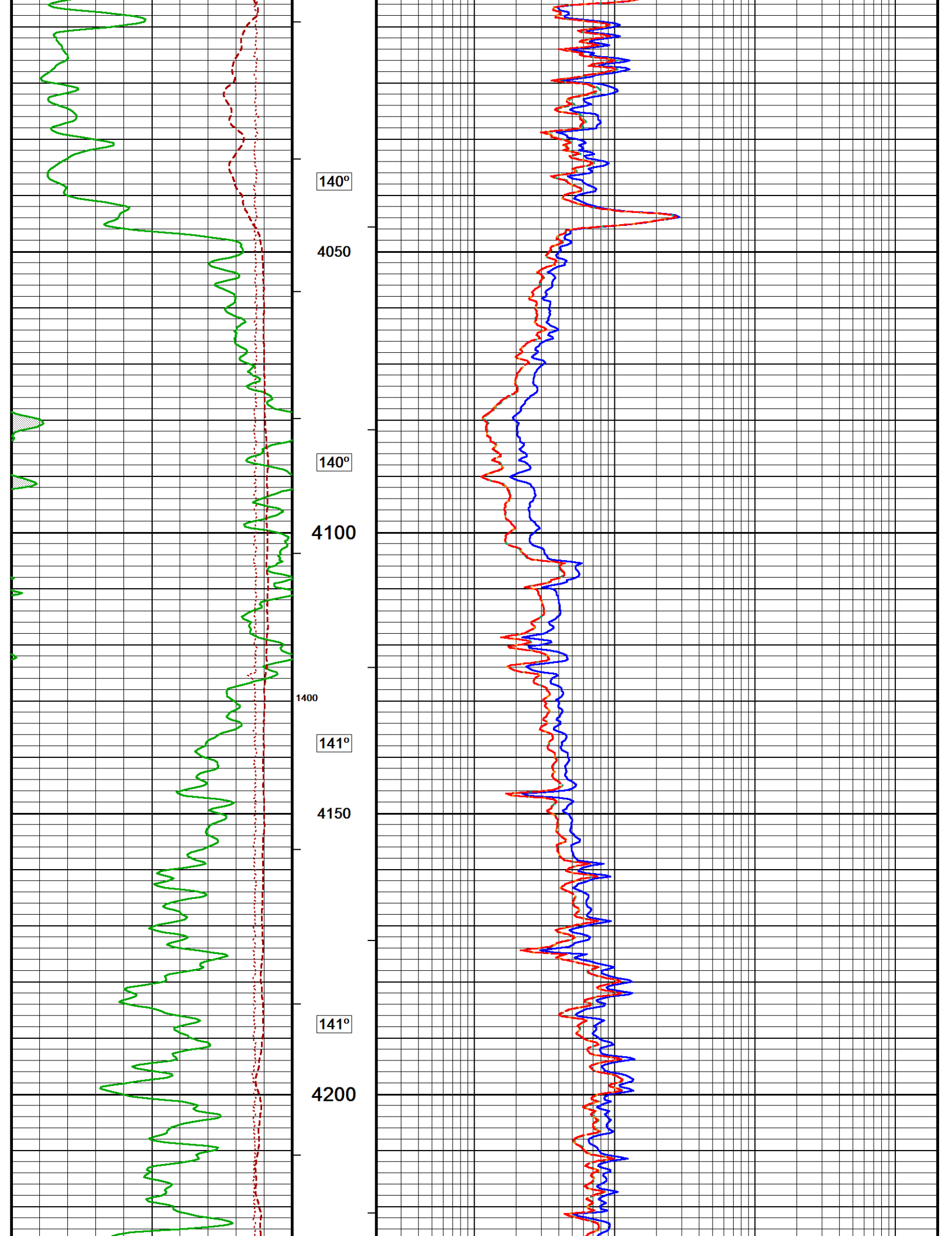
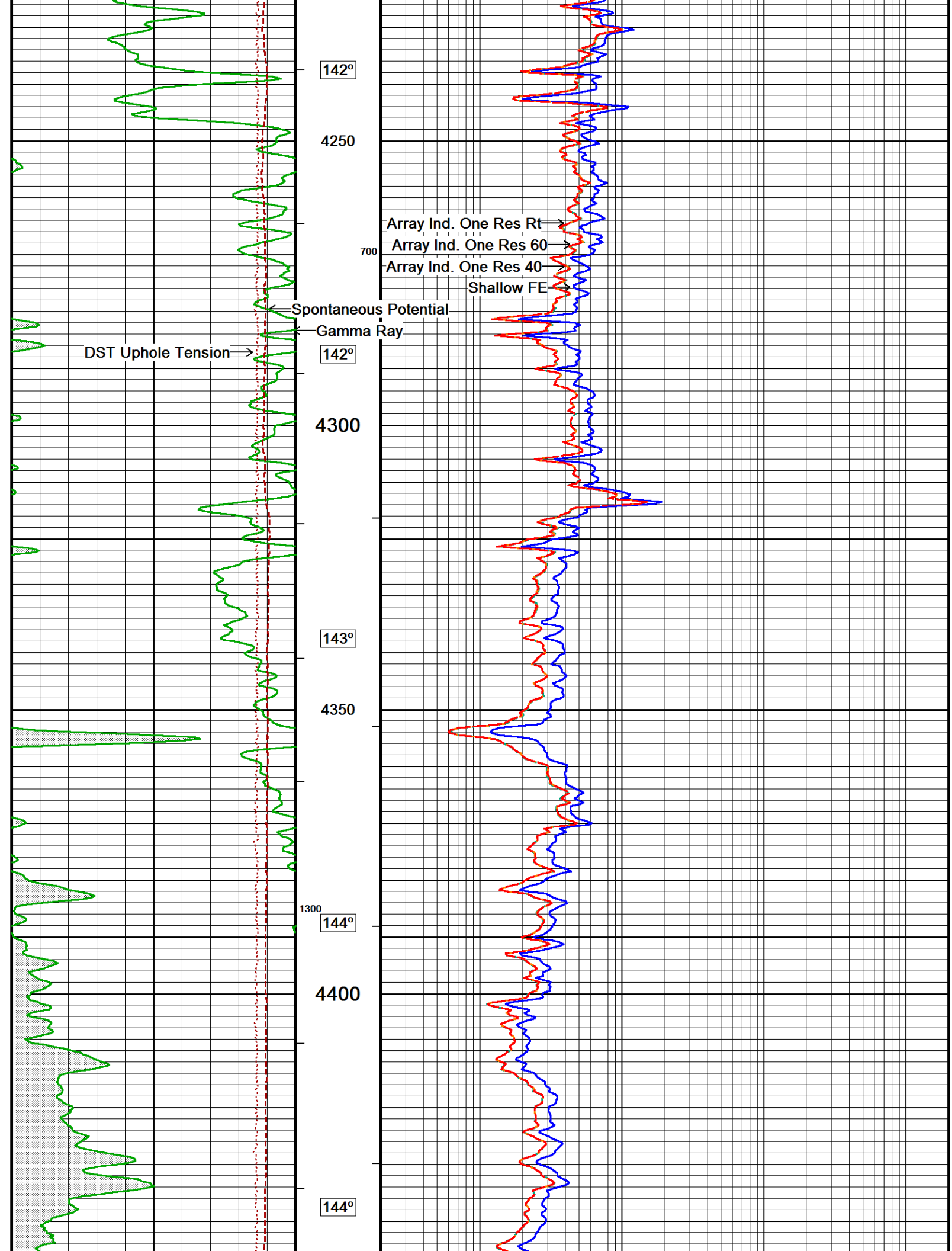
3150
130°
3200
131°
3250
132°
3300
132°

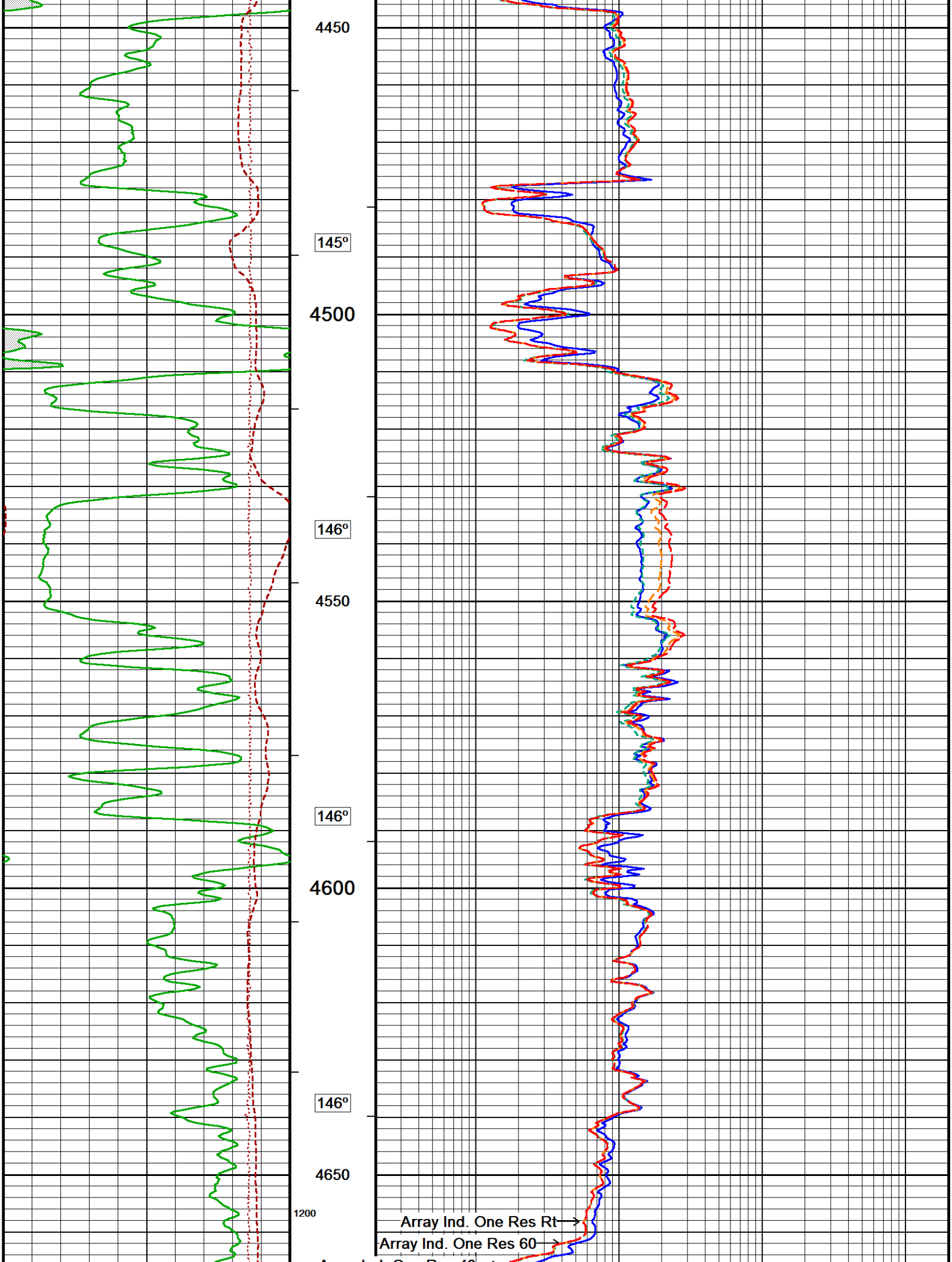

3350
133°
3400
133°
3450
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
134°
Spontaneous Potential
Gamma Ray
DST Uphole Tension
3500
134°
3550

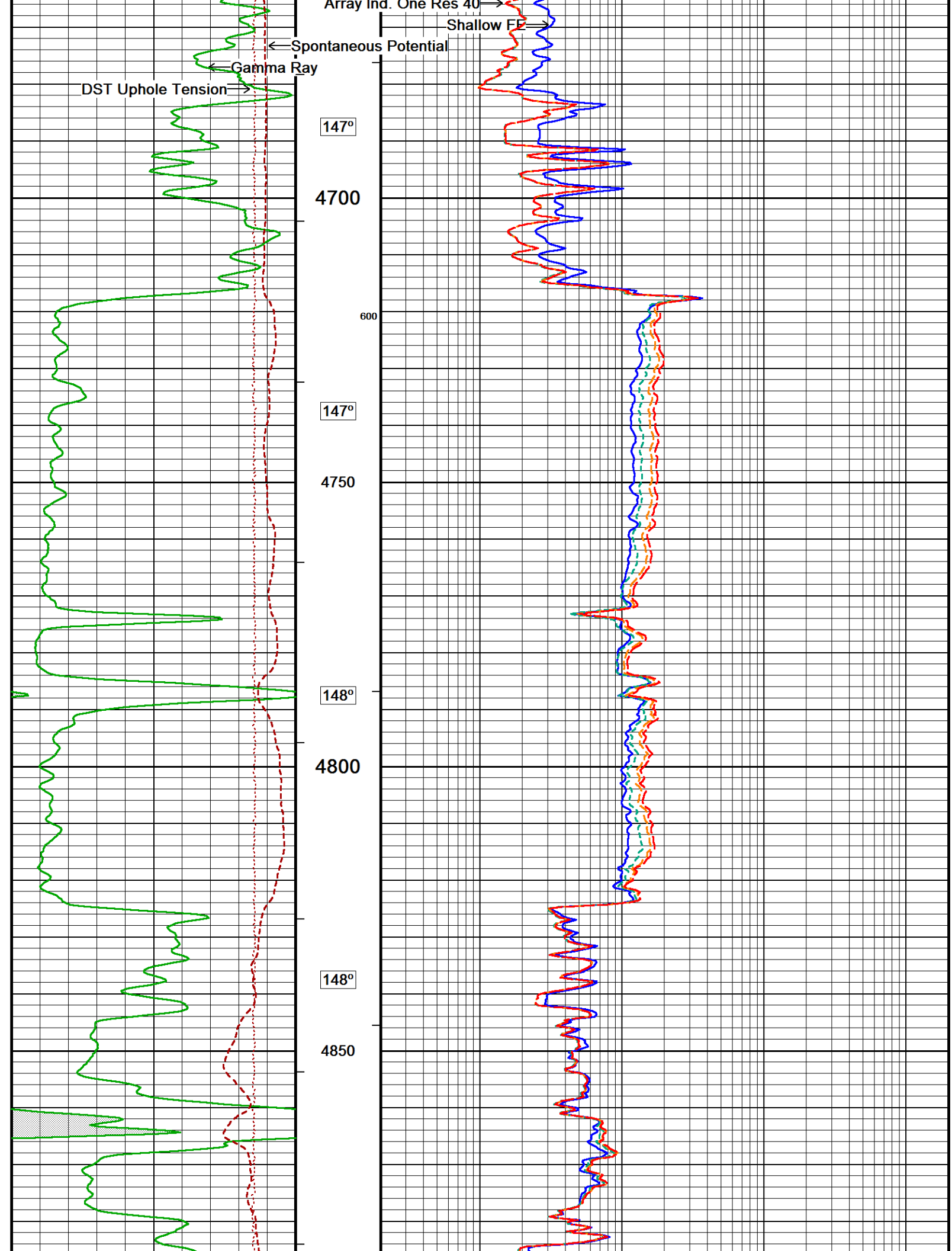

135°
3600
135°
3650
136°
3700
136°
3750

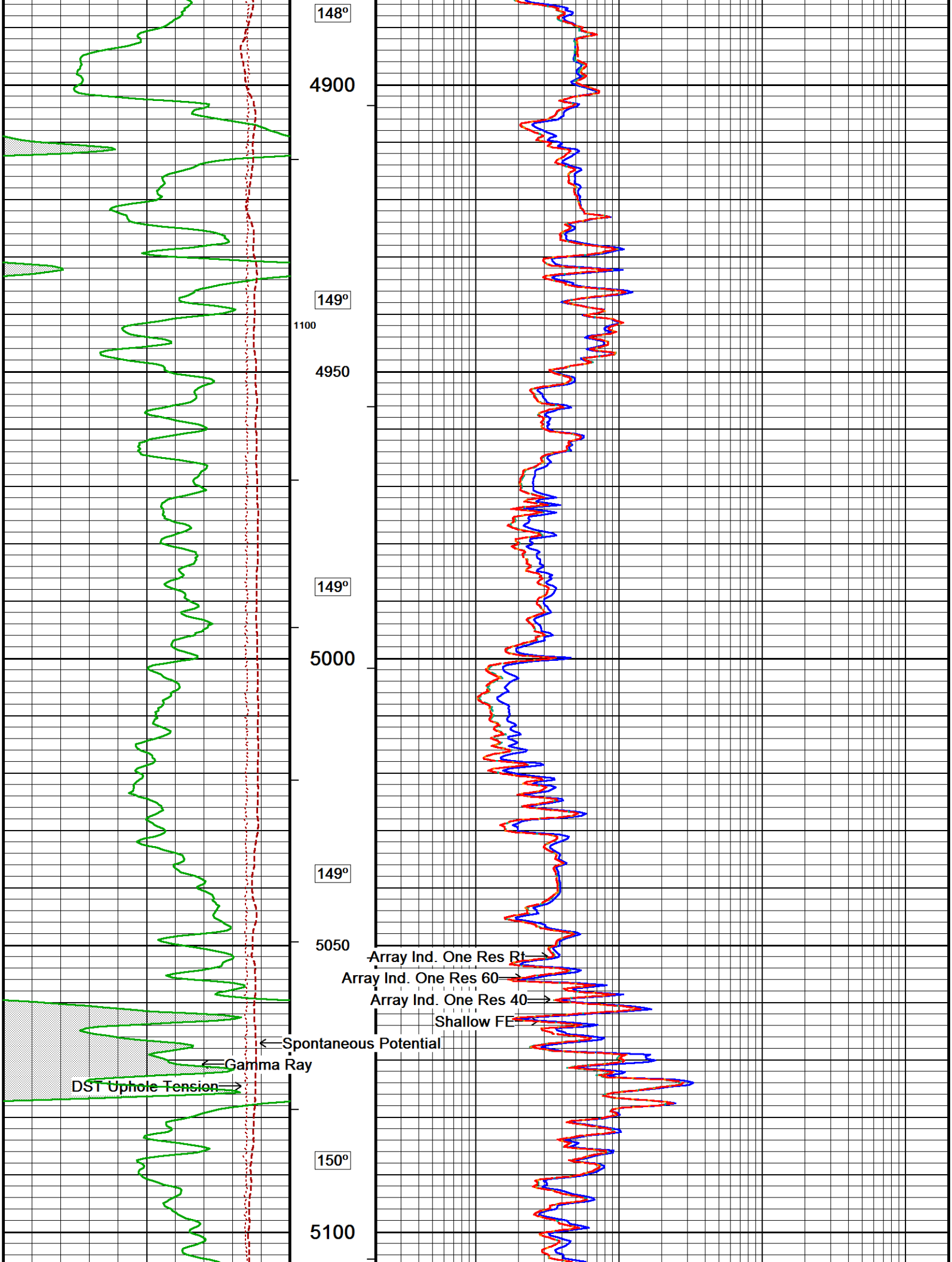

137°
3800
137°
3850
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
138°
Gamma Ray
DST Uphole Tension
3900
138°
3950
139°
4000

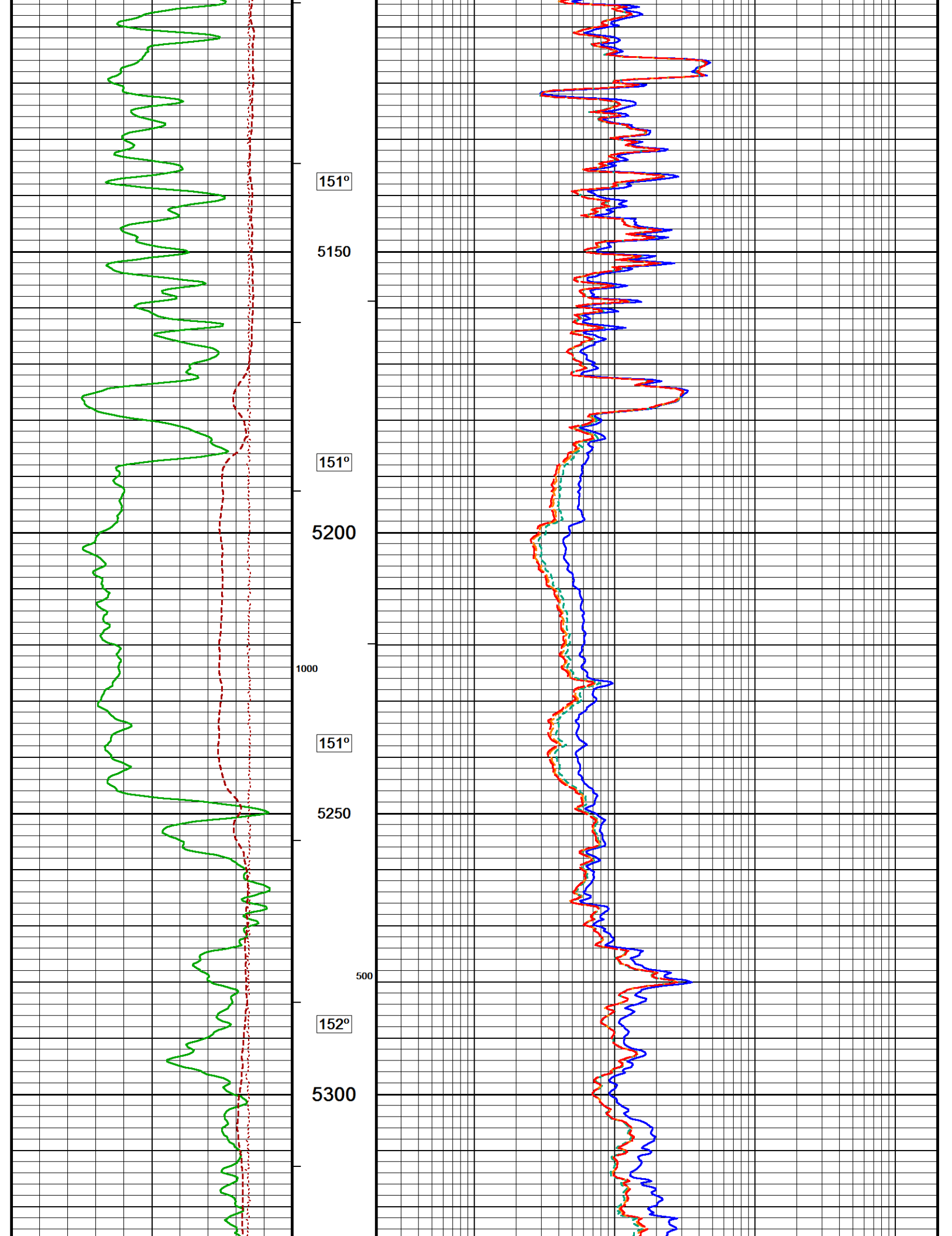

140°
4050
140°
4100
1400
141°
4150
141°
4200

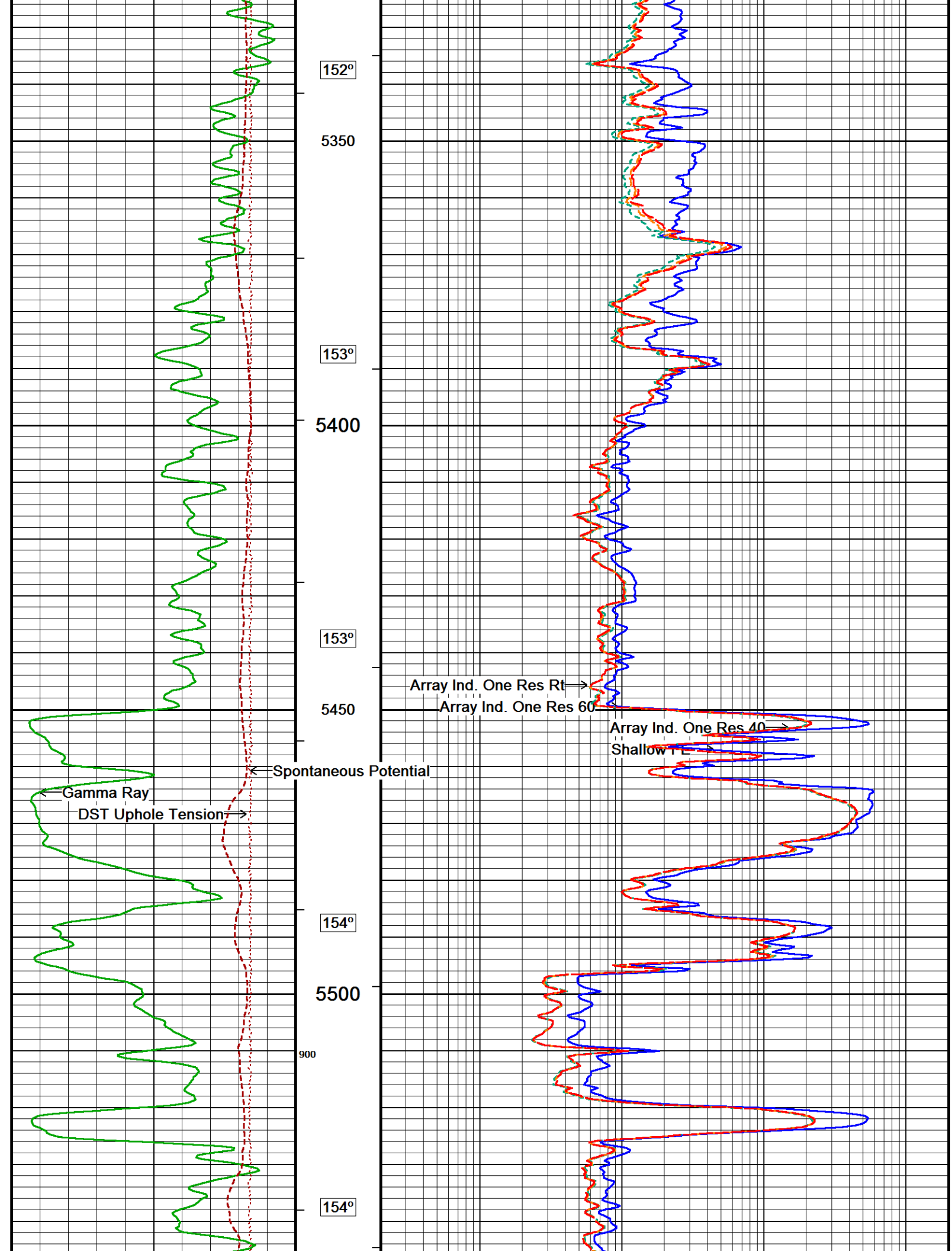

142°
4250
Array Ind. One Res Rt
700
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
142°
4300
143°
4350
1300
144°
4400
144°

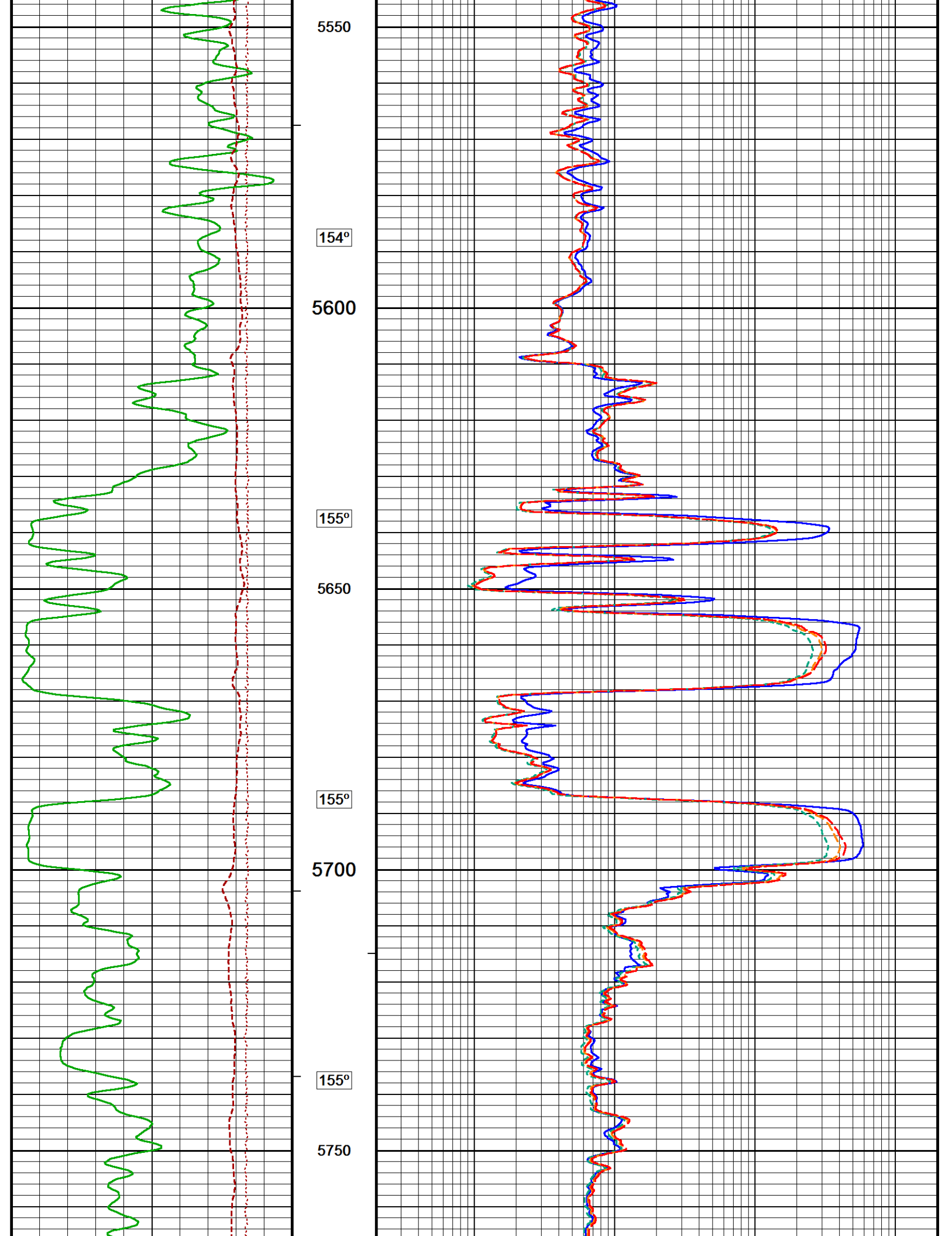

4450
145°
4500
146°
4550
146°
4600
146°
4650
1200
Array Ind. One Res Rt
Array Ind. One Res 60

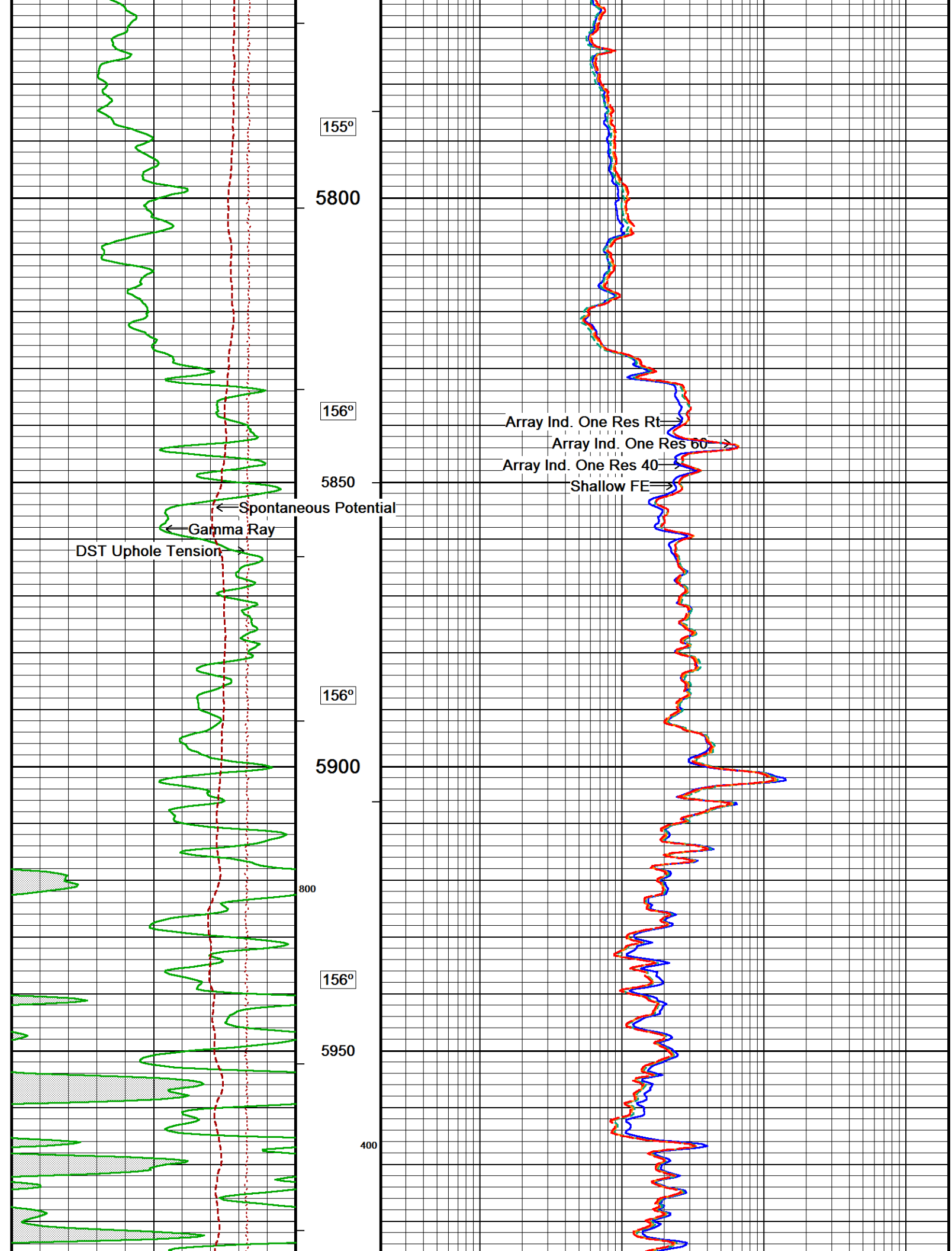

Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
147°
4700
600
147°
4750
148°
4800
148°
4850

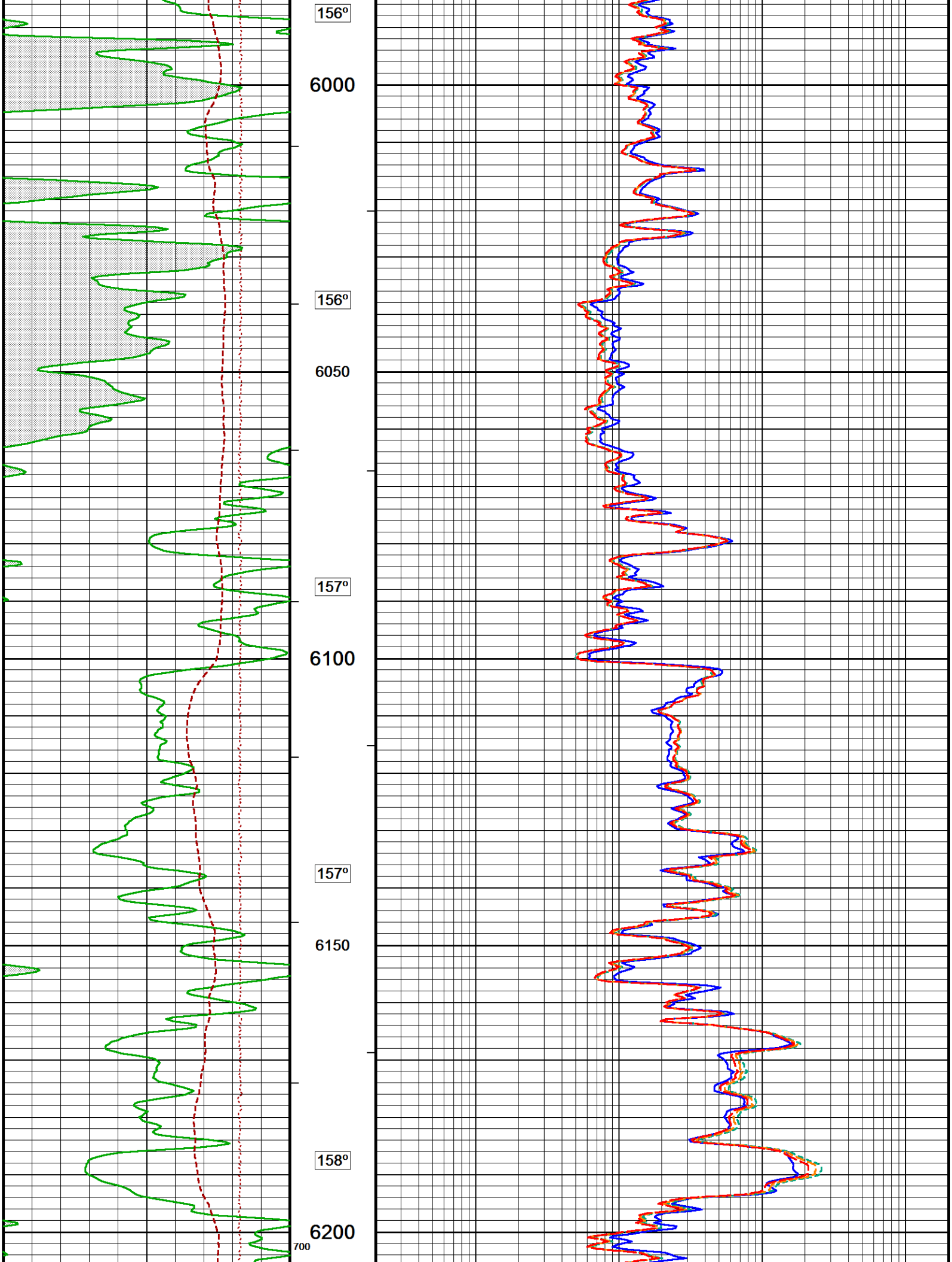

148°
4900
149°
1100
4950
149°
5000
149°
5050
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
150°
5100

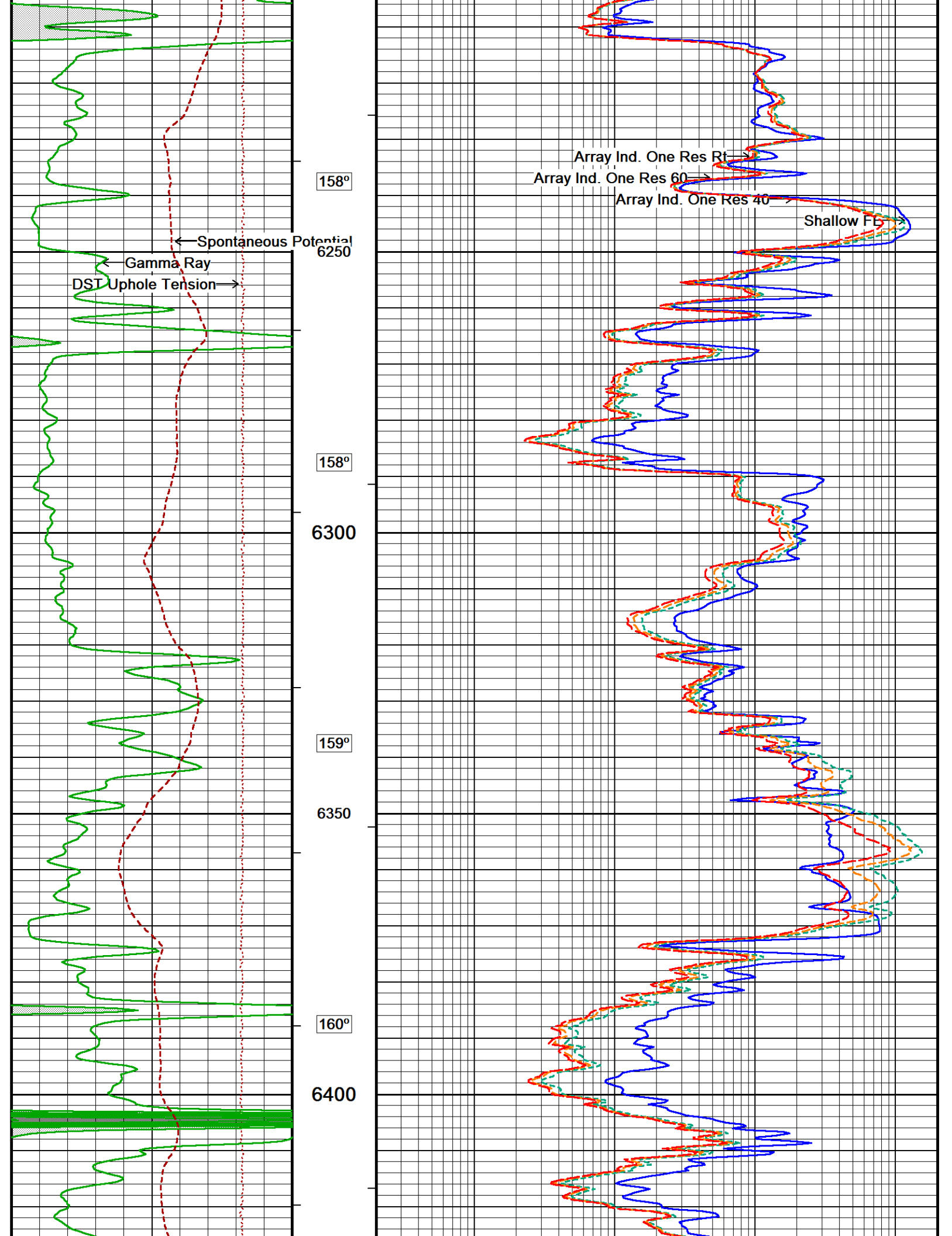

151°
5150
151°
5200
1000
151°
5250
500
152°
5300

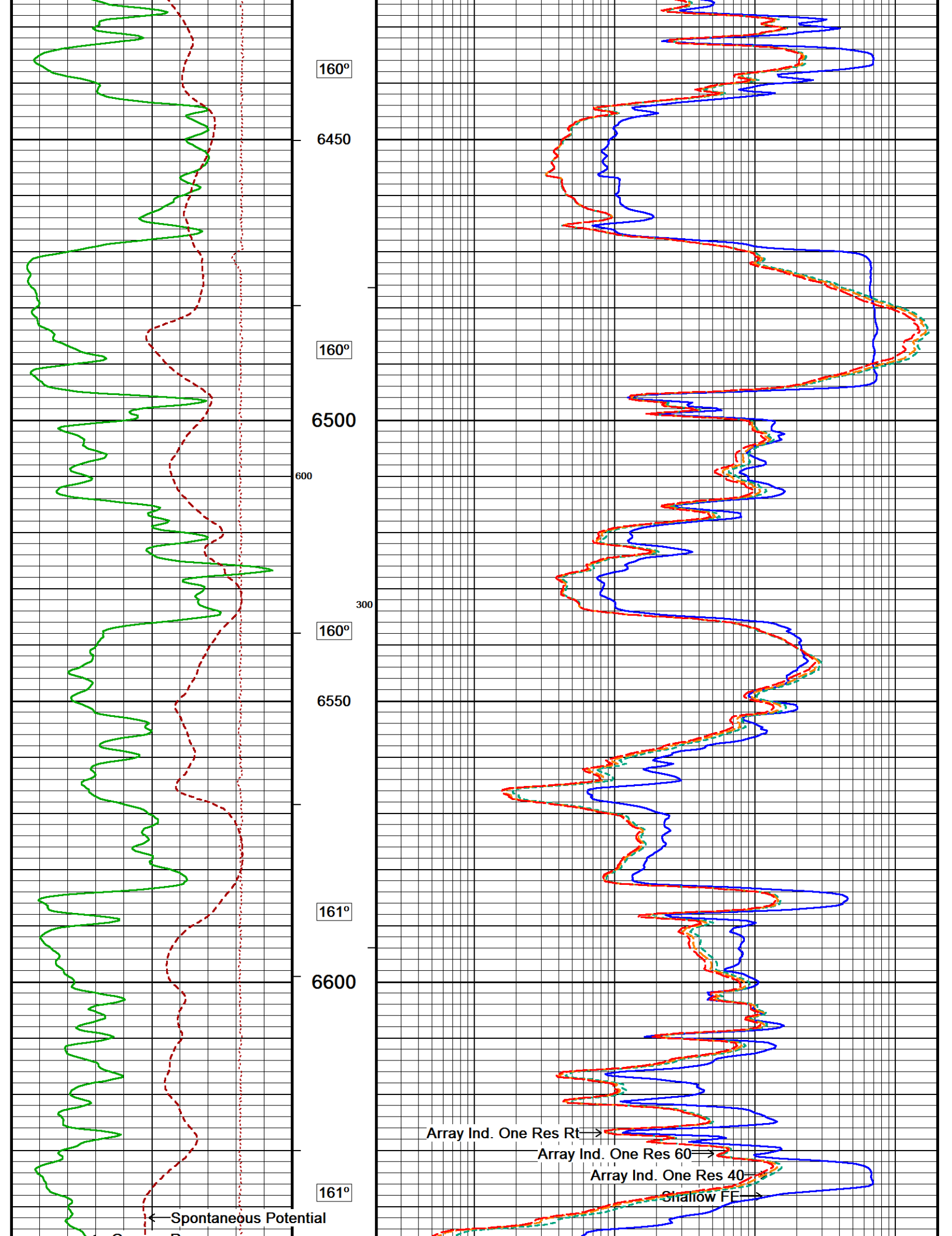

152°
5350
153°
5400
153°
5450
154°
5500
900
154°
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow
Spontaneous Potential
Gamma Ray
DST Uphole Tension

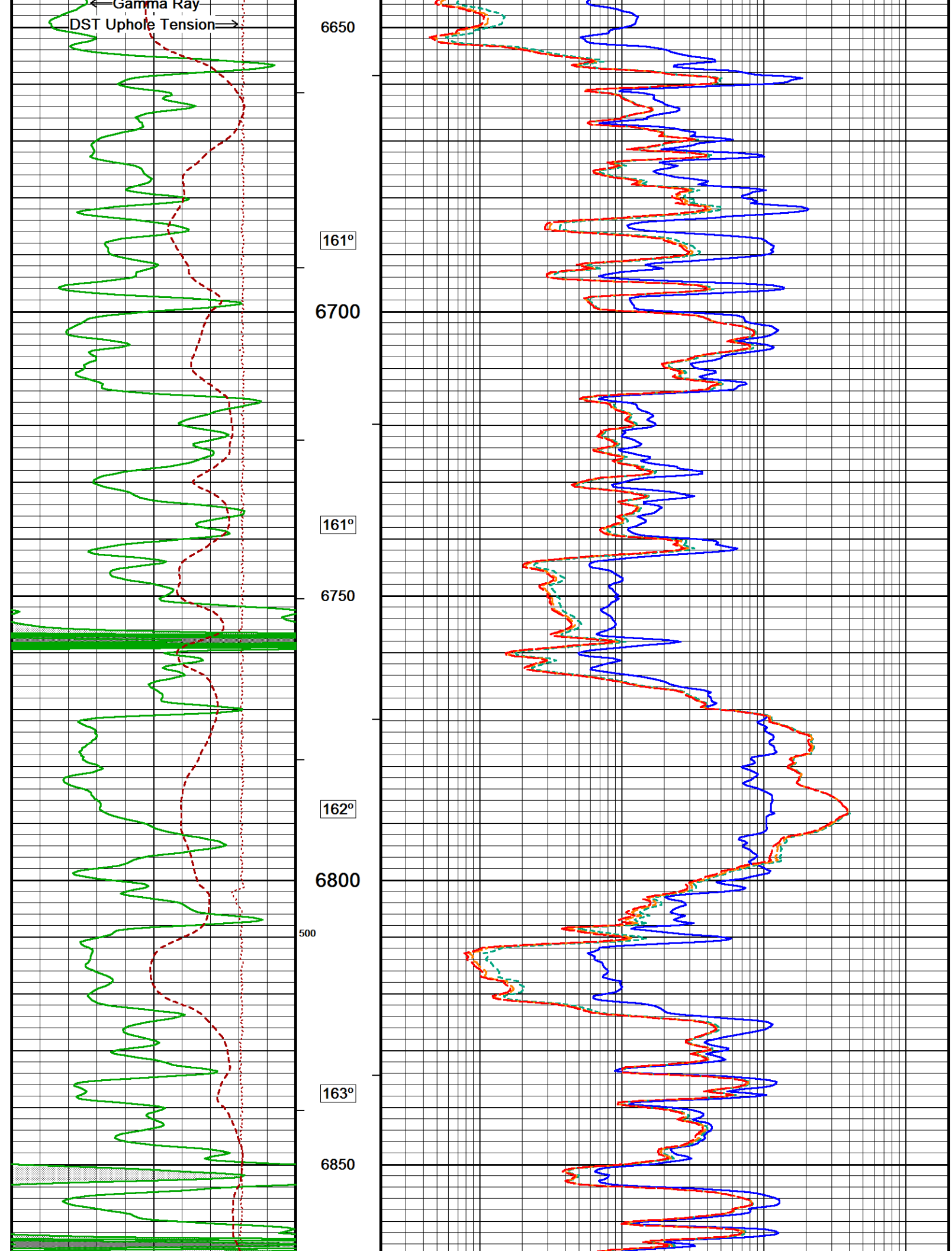

5550
154°
5600
155°
5650
155°
5700
155°
5750

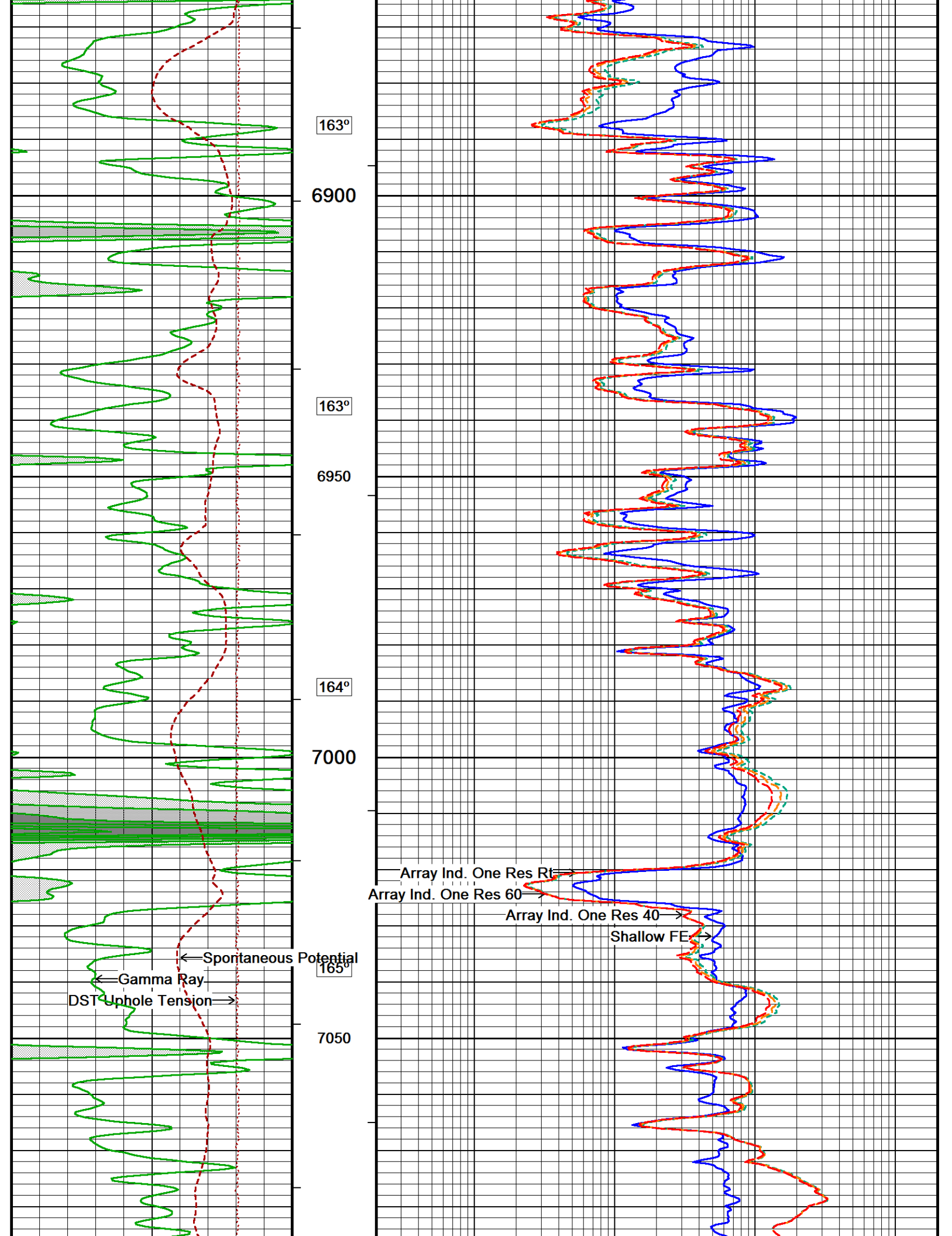

155°
5800
156°
5850
Spontaneous Potential
Gamma Ray
DST Uphole Tension
156°
5900
800
156°
5950
400
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

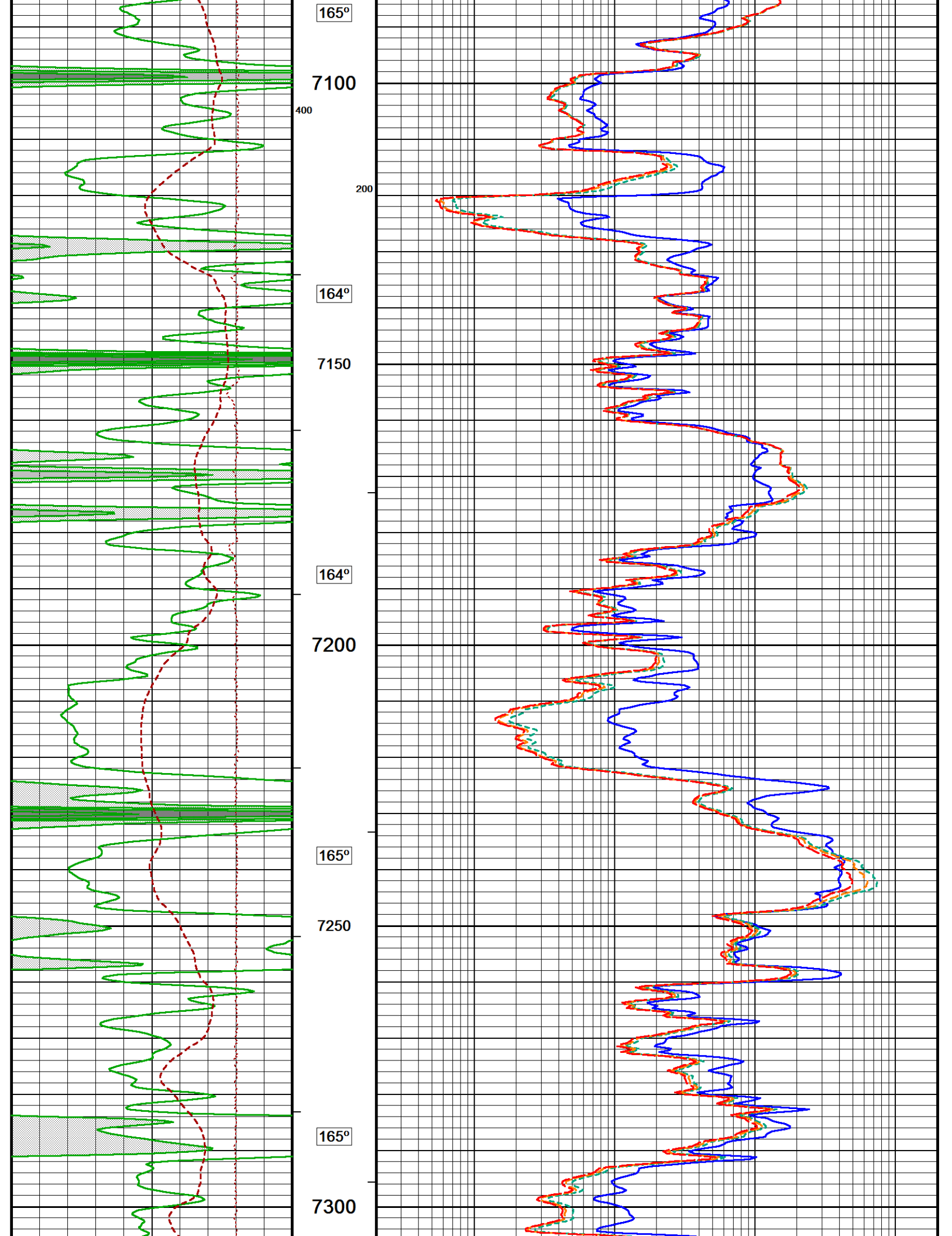

156°
6000
156°
6050
157°
6100
157°
6150
158°
6200
700

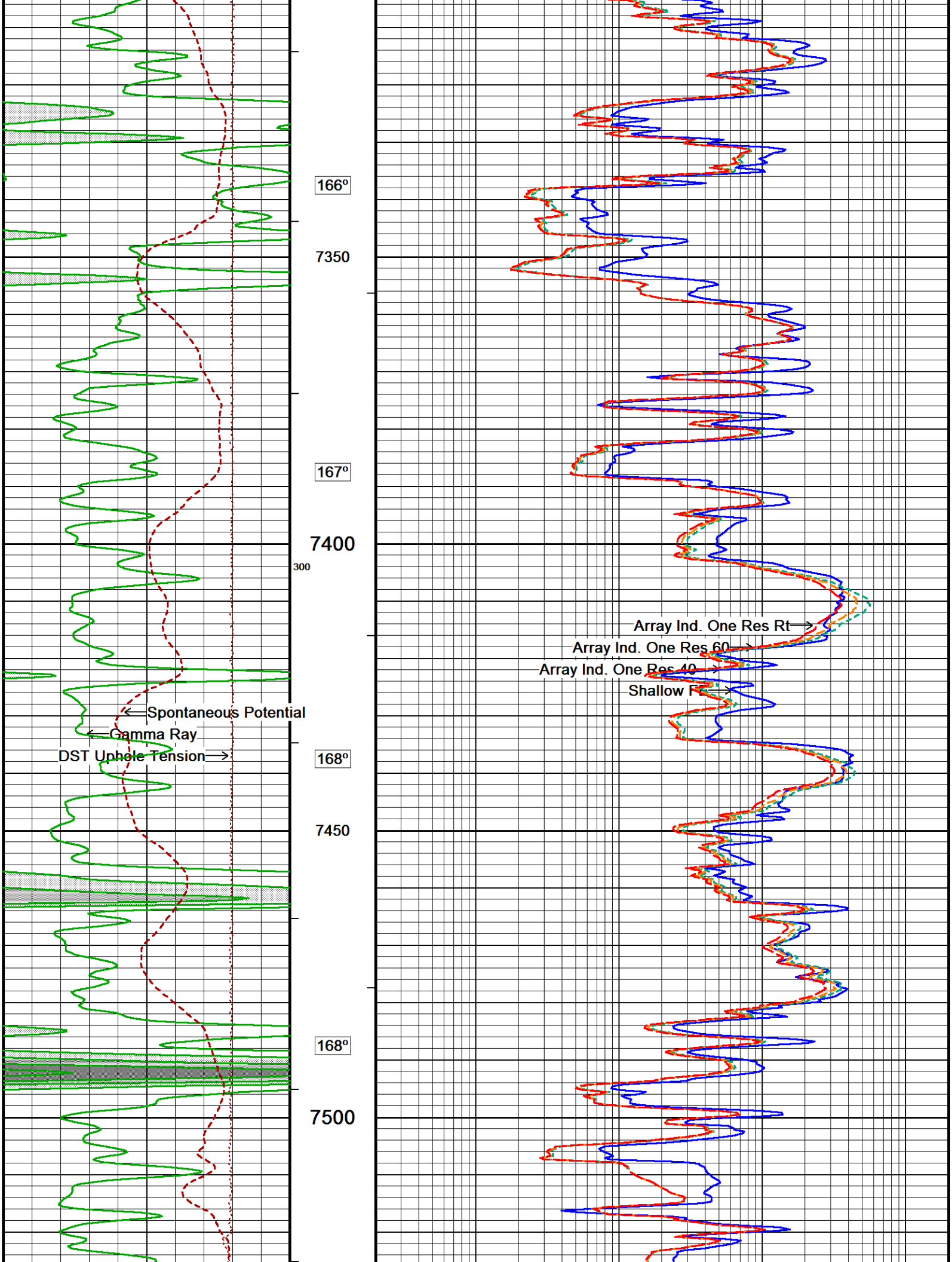

Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FD
Spontaneous Potential
Gamma Ray
DST Uphole Tension
158°
6250
158°
6300
159°
6350
160°
6400

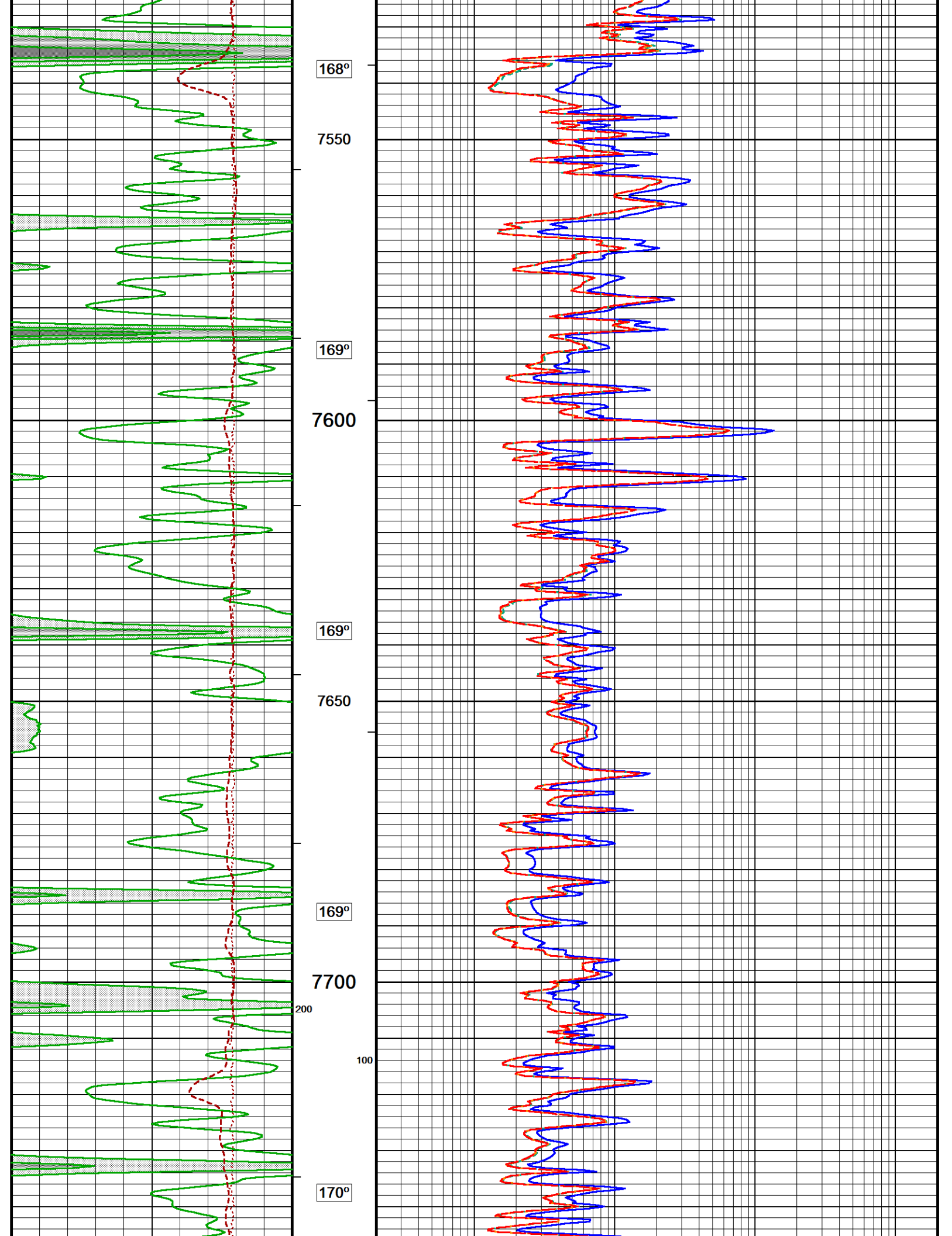

160°
6450
160°
6500
600
300
160°
6550
161°
6600
161°
Spontaneous Potential
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE

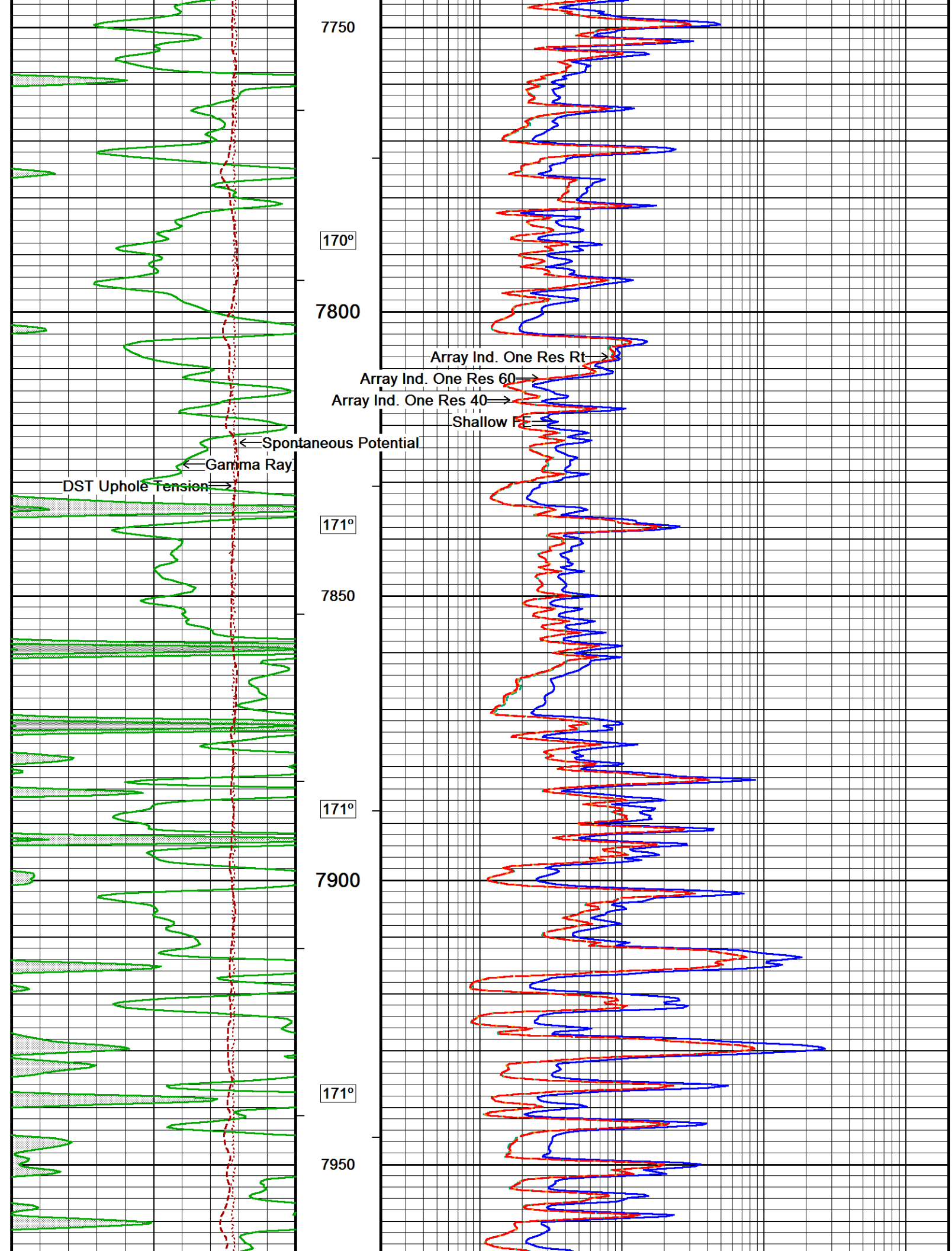

←Gamma Ray
DST Uphole Tension→
6650
161°
6700
161°
6750
162°
6800
500
163°
6850

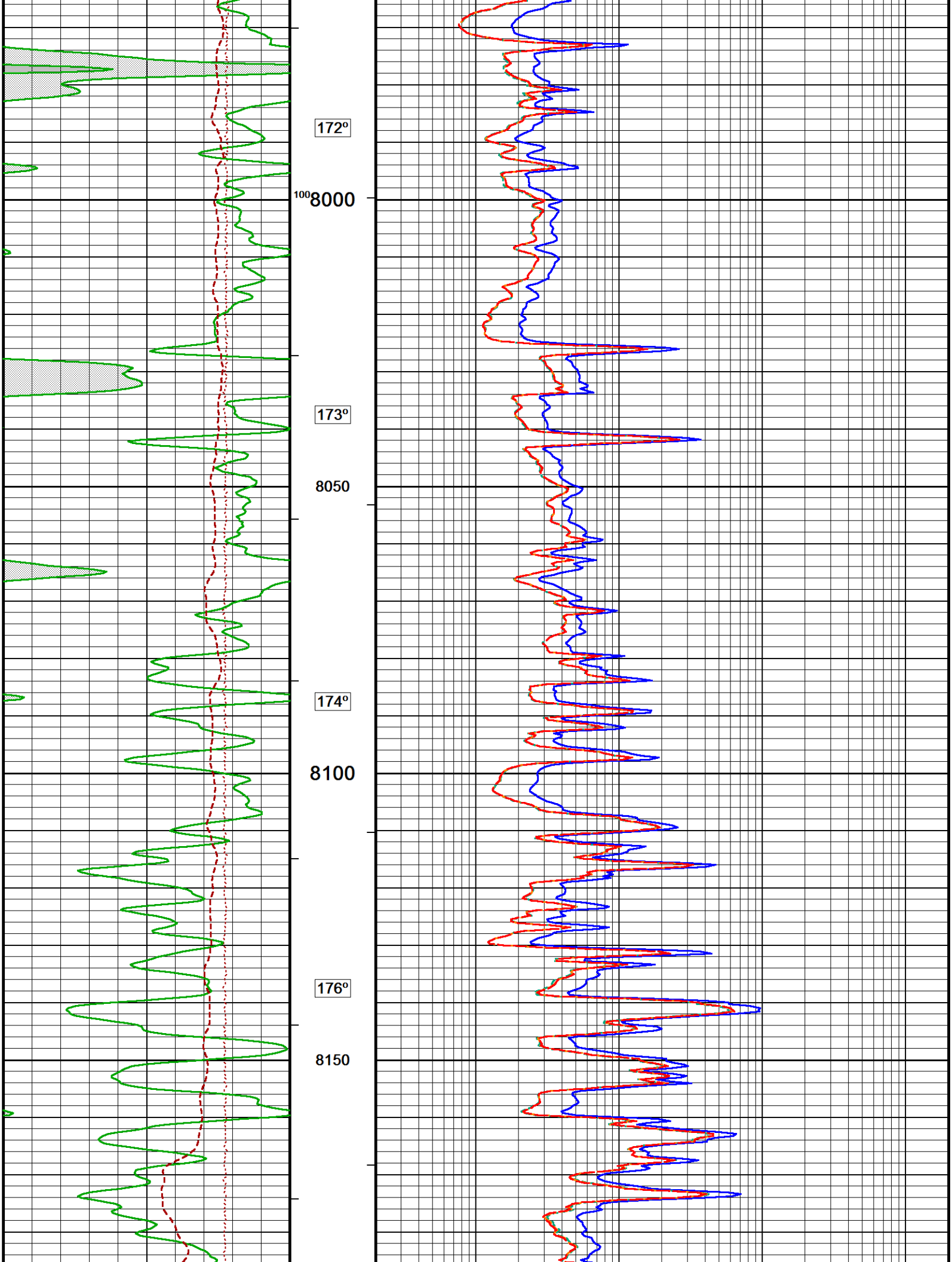

163°
6900
163°
6950
164°
7000
165°
7050
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension

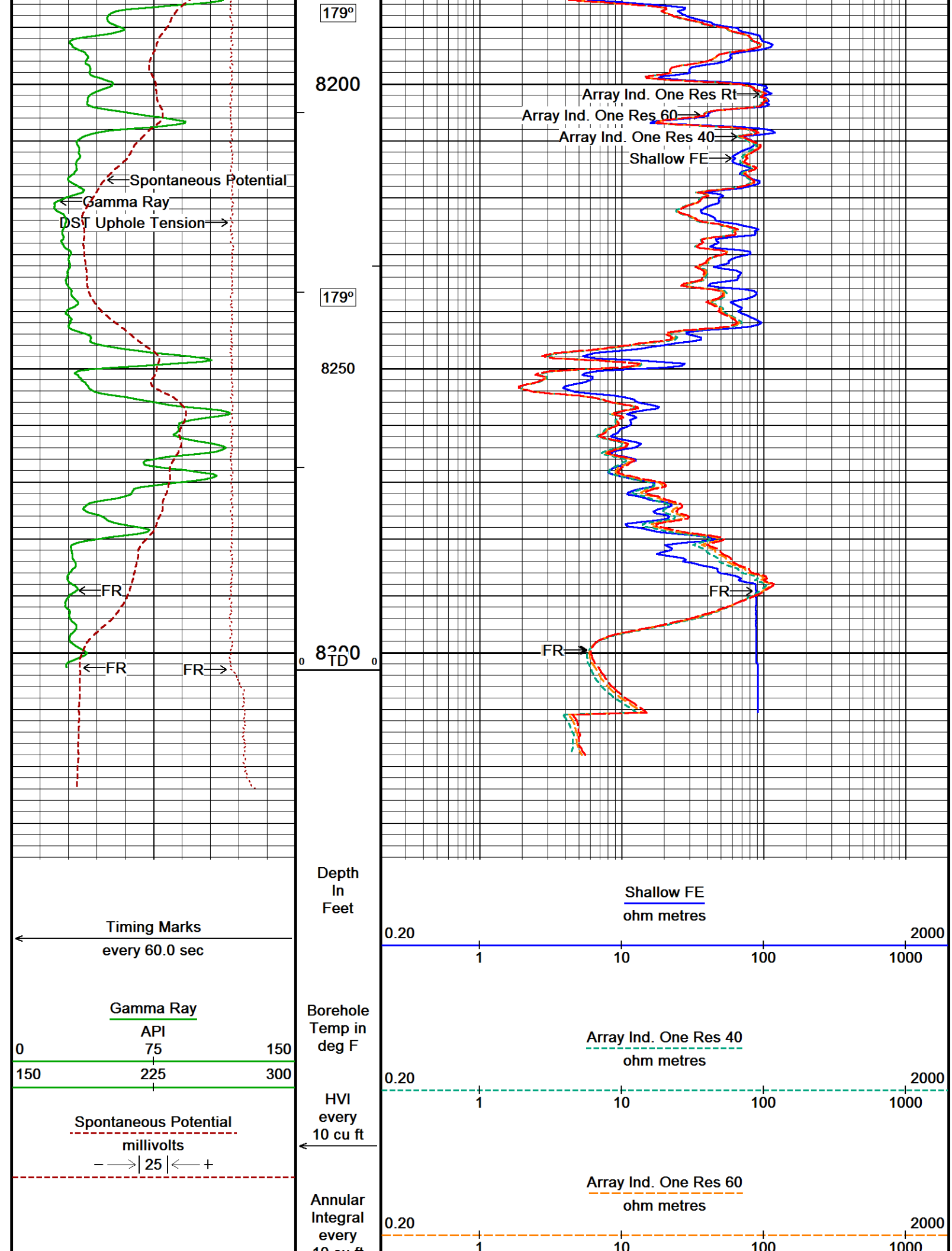

165°
7100
400
200
164°
7150
164°
7200
165°
7250
165°
7300


166°
7350
167°
7400
300
168°
7450
168°
7500
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow F


168º
7550
169º
7600
169º
7650
169º
7700
200
100
170º


7750
170°
7800
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow R
Spontaneous Potential
Gamma Ray
DST Uphole Tension
171°
7850
171°
7900
171°
7950


172°
100
8000
173°
8050
174°
8100
176°
8150


179°
8200
179°
8250
TD
Spontaneous Potential
Gamma Ray
DST Uphole Tension
FR
FR
FR
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FE
FR
FR
Depth
In
Feet
Timing Marks
every 60.0 sec
Gamma Ray
API
0
75
150
150
225
300
Spontaneous Potential
millivolts
25
Borehole
Temp in
deg F
HVI
every
10 cu ft
Annular
Integral
every
Shallow FE
ohm metres
0.20
2000
1
10
100
1000
Array Ind. One Res 40
ohm metres
0.20
2000
1
10
100
1000
Array Ind. One Res 60
ohm metres
0.20
2000
1
10
100
1000

10 cu ft

DST Uphole Tension
pounds
5000 0

Replay
Scale
1:240

Array Ind. One Res Rt
ohm metres
0.20 2000
1 10 100 1000

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 18.03.9344\Data\Murfin Moonraker #6-27\MERGED MAIN PASS final.dta
System Versions: Plotted with 18.03.9344

Plotted on 20-JAN-2019 14:06
Recorded on 20-JAN-2019 03:03

5 INCH MAIN

REPEAT SECTION

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 18.03.9344\Data\Murfin Moonraker #6-27\REPEAT PASS.dta
System Versions: Logged with 18.03.9344 Plotted with 18.03.9344

Plotted on 20-JAN-2019 14:06
Recorded on 20-JAN-2019 02:40

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
− 25 +

Depth
in
Feet

Borehole
Temp in
deg F

HVI
every
10 cu ft

Annular
Integral
every
10 cu ft

Shallow FE
ohm metres
0.20 2000
1 10 100 1000

Array Ind. One Res 40
ohm metres
0.20 2000
1 10 100 1000

Array Ind. One Res 60
ohm metres
0.20 2000
1 10 100 1000

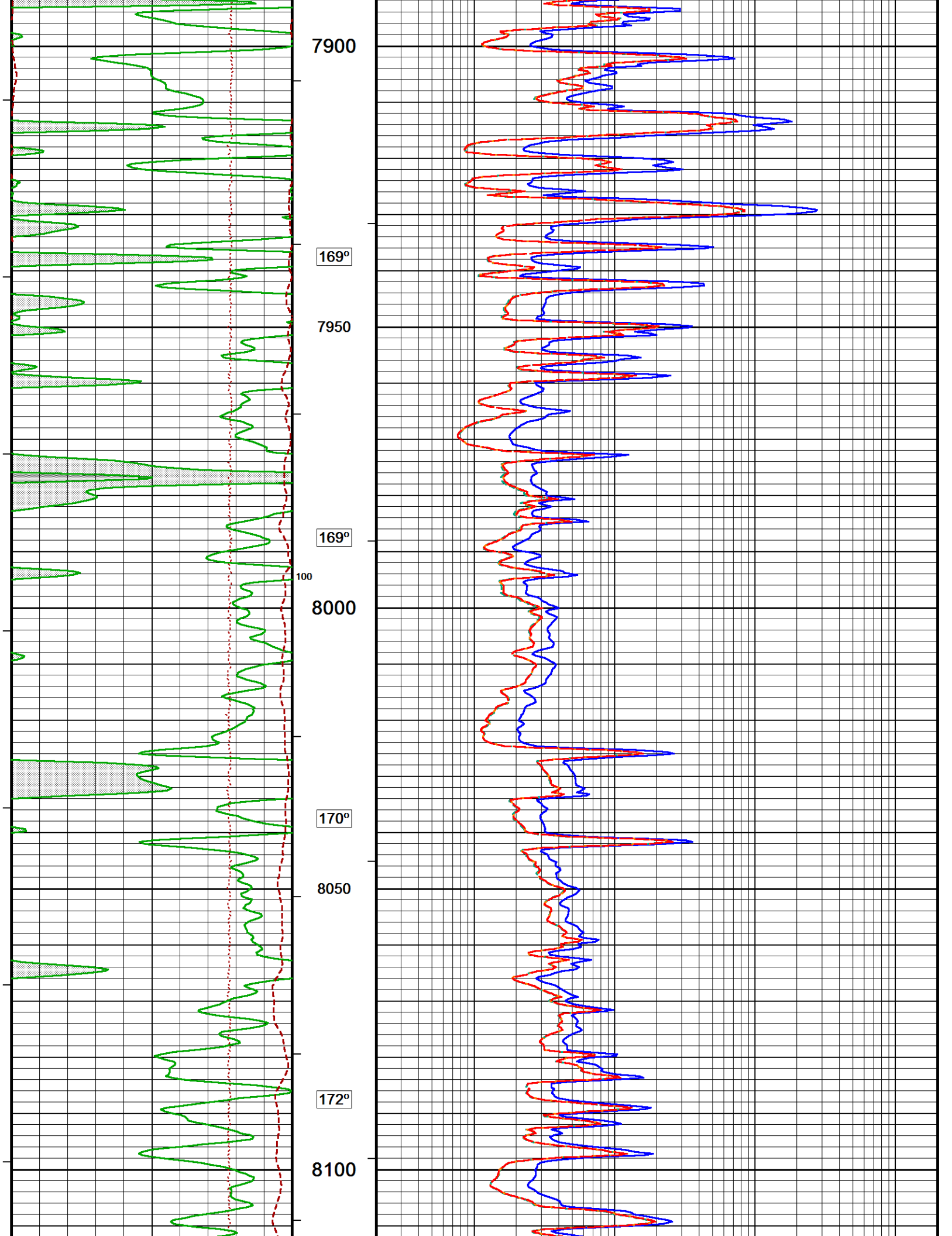
Array Ind. One Res Rt
ohm metres
0.20 2000
1 10 100 1000

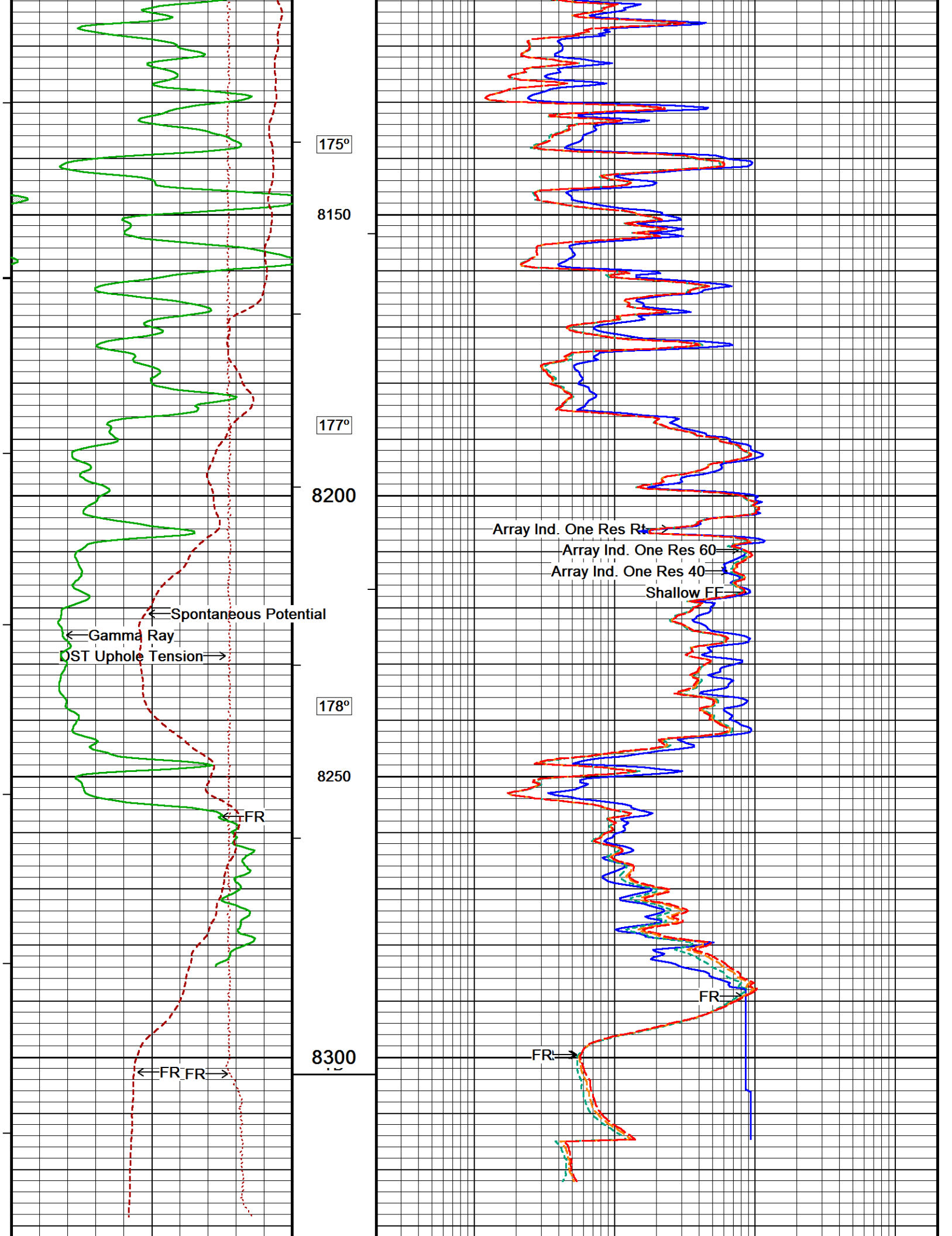
DST Uphole Tension
pounds
5000 0

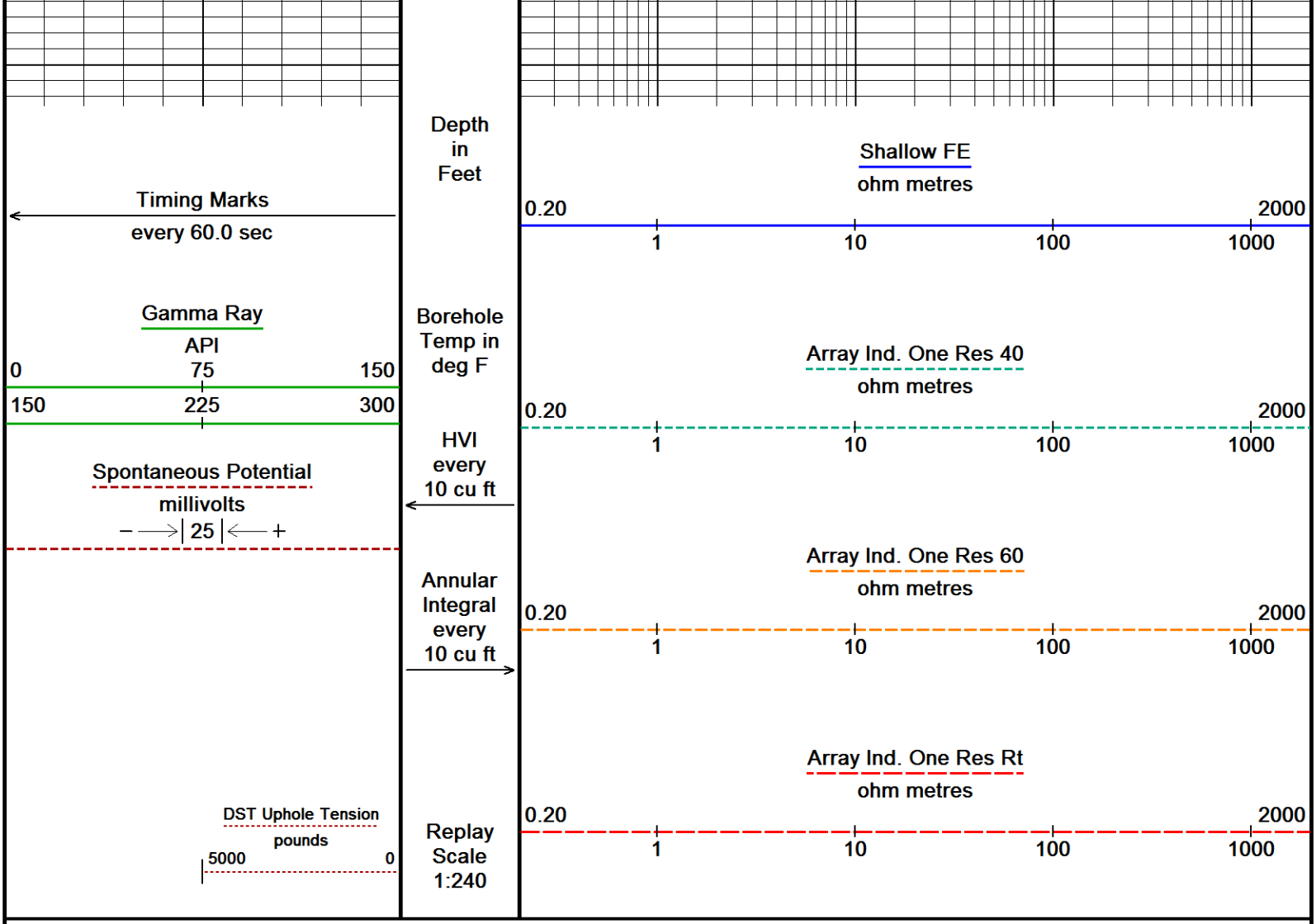
Replay
Scale
1:240

7850

170°


7900
169°
7950
169°
100
8000
170°
8050
172°
8100


175°
8150
177°
8200
178°
8250
8300
Spontaneous Potential
Gamma Ray
OST Uphole Tension
FR
FR
FR
Array Ind. One Res Rt
Array Ind. One Res 60
Array Ind. One Res 40
Shallow FF
FR
FR



Depth Based Data - Maximum Sampling Increment 10.0cm — Plotted on 20-JAN-2019 14:06

Filename: C:\Minimus 18.03.9344\Data\Murfin Moonraker #6-27\REPEAT PASS.dta — Recorded on 20-JAN-2019 02:40

System Versions: Logged with 18.03.9344 Plotted with 18.03.9344

REPEAT SECTION

BEFORE SURVEY CALIBRATION

C:\Minimus 18.03.9344\Data\Murfin Moonraker #6-27\TOOLSTRING.dta

General Constants All 000 — Last Edited on 20-JAN-2019,06:53

General Parameters		
Mud Resistivity	0.760	ohm-metres
Mud Resistivity Temperature	94.000	degrees F
Water Level	0.000	feet
Borehole Fluid Processing	Wet Hole	
Hole/Annular Volume and Differential Caliper Parameters		
HVOL Method	Single Caliper	
HVOL Caliper 1	None	
HVOL Caliper 2	N/A	
Annular Volume Diameter	5.500	inches
Caliper for Differential Caliper	None	
Rwa Parameters		
Porosity used	N/A	
Resistivity used	N/A	
RWA Constant A	N/A	
RWA Constant M	N/A	
SW/APOR Tool Source	0.000	

High Resolution Temperature Calibration MCG-D.K 443

Field Calibration on 12-OCT-2018,05:20

	Measured	Calibrated(Deg F)
Lower	50.00	50.00
Upper	212.00	212.00

High Resolution Temperature Constants MCG-D.K 443

Last Edited on 12-OCT-2018,05:20

Pre-filter Length	11

Gamma Calibration MCG-D.K 443

Field Calibration on 18-JAN-2019 15:28

	Measured	Calibrated (API)
Background	192	135
Calibrator (Gross)	841	591
Calibrator (Net)	648	456

Gamma Calibration Tolerances MCG-D.K 443

		1.40	1.475	1.55	
Ratio	1.422				Counts/API

Gamma Constants MCG-D.K 443

Last Edited on 20-JAN-2019,00:40

Gamma Calibrator Number	MCGGRCC141	
GRC-M Calibrator Jig in Use?	NO	
Inactive Background Jig in Use?	NO	
Mud Density	1.13	gm/cc
Caliper Source for Processing	Density Caliper	
Tool Position	Eccentred	
Potassium Equivalence	Chloride	
K Mud Concentration	0.00	%

FE Calibration MFE-B.J 352

Base Calibration on 19-JAN-2019 15:43
Field Check on 19-JAN-2019 15:50

	Resistor 1 (ohm)	Resistor 2 (ohm)
	0.0	1000.0

Base Calibration

	Measured	Calibrated (ohm-m)
Reference 1	0.0	0.0
Reference 2	962.9	126.8
Base Check		281.6
Field Check		281.6

FE Calibration Tolerances MFE-B.J 352

		-3%	980.0	+3%	
Reference 2	962.9				ohm

		-2%	277.0	+2%	
Base Check	281.6				ohm-m

		-2%	281.6	+2%	
Field Check	281.6				ohm-m

FE Constants MFE-B.J 352

Last Edited on 20-JAN-2019,00:45

Running Mode	No Sleeve	
MFE K Factor	0.1268	
Borehole Correction Constants		
Sonde Position	0.5	inches
Hole Size Source	Density Caliper	
Hole Size Constant Value	N/A	inches
Rm Source	Global Value: Temperature Corrected	
Temp. for Rm Corr.	MCG External Temperature	

Induction Calibration MAI-B.J 390

Factory Loop Calibration on 07-JAN-2019 10:28
Field Check on 19-JAN-2019 15:38

Factory Loop Calibration

High Conductivity Reference Resistor	3.3	ohm
Low Conductivity Reference Resistor	333.3	ohm

	Measured Signal (unitless)		Reference Conductivity (mmho/m)		Calibration	
Array	Low	High	Low	High	Gain	Offset
1 (near)	16.8	458.6	9.3	966.2	2.166	-27.2

2	6.3	377.7	7.6	821.4	2.191	-6.2
3	3.8	258.6	5.2	566.0	2.200	-3.0
4 (far)	1.9	132.3	2.6	279.2	2.121	-1.4

Array Temperature 77.9 Deg F

Tool Checks

	Factory Reference (mmho/m)		Before Survey (mmho/m)	
Array	Low	High	Low	High
1 (near)	13.2	3960.1	13.0	3959.2
2	29.9	3563.5	29.8	3563.3
3	27.9	3061.4	27.8	3061.3
4 (far)	19.7	2087.8	19.7	2088.0
Array Temperature		64.9		58.9 Deg F

Induction Check Tolerances MAI-B.J 390

Low Array 1	13.0	11.7 13.2 14.7	mmho/m	High Array 1	3959.2	-0.5% 3960.1 +0.5% mmho/m
Low Array 2	29.8	28.4 29.9 31.4	mmho/m	High Array 2	3563.3	-0.5% 3563.5 +0.5% mmho/m
Low Array 3	27.8	26.4 27.9 29.4	mmho/m	High Array 3	3061.3	-0.5% 3061.4 +0.5% mmho/m
Low Array 4	19.7	18.2 19.7 21.2	mmho/m	High Array 4	2088.0	-0.5% 2087.8 +0.5% mmho/m

Induction Constants MAI-B.J 390

Last Edited on 20-JAN-2019,00:47

Induction Model	RtAP-WBM	
Borehole Correction Constants		
Tool Centred	No	
Hole Size Source	Density Caliper	
Hole Size Constant Value	N/A	inches
Stand-off Type	Fins	
Stand-off	0.50	inches
Number of Fins on Stand-off	8.0000	
Stand-off Fin Angle	45.00	degrees
Stand-off Fin Width	0.5000	inches
Rm Source	Global Value: Temperature Corrected	
Temp. for Rm Corr.	MCG External Temperature	
Borehole Correction Method	Default	
Squasher Start	0.0020	mhos/metre
Squasher Offset	N/A	mhos/metre

Borehole Normalisation

DRM1	0.0000	DRC1	0.0000
DRM2	0.0000	DRC2	0.0000
MRM1	0.0000	MRC1	0.0000
MRM2	0.0000	MRC2	0.0000
SRM1	0.0000	SRC1	0.0000
SRM2	0.0000	SRC2	0.0000

Calibration Site Corrections		
Channel 1	0.00	mmhos/metre
Channel 2	0.00	mmhos/metre
Channel 3	0.00	mmhos/metre
Channel 4	0.00	mmhos/metre
Symmetrised Receiver Gains		
Receiver 1	1.00	
Receiver 2	1.00	
Receiver 3	1.00	
Receiver 4	1.00	
Apparent Porosity and Water Saturation Constants		
Archie Constant (A)	1.00	
Cementation Exponent (M)	2.00	
Saturation Exponent (N)	2.00	
Saturation of Water for Apor	100.00	percent
Resistivity of Water for Apor and Sw	0.05	ohm-m

Resistivity of Mud Filtrate for Sw	0.00	ohm-m
Source for Rt	0.00	
Source for Rxo	0.00	

Caliper Calibration MPD-C.A 216

Base Calibration on 18-JAN-2019 17:06
Field Calibration on 18-JAN-2019 17:08

Base Calibration

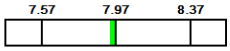
Reading No	Measured	Calibrator Size (in)
1	16199	3.99
2	24624	5.98
3	33344	7.97
4	41632	9.86
5	50912	11.92
6	N/A	N/A

Field Calibration

Measured Caliper (in)	Actual Caliper (in)
7.93	7.97

Caliper Calibration Tolerances MPD-C.A 216

Long Arm Field Cal. 7.93 in



DOWNHOLE EQUIPMENT

C:\Minimus 18.03.9344\Data\Murfin Moonraker #6-27\TOOLSTRING.dta

Cablehead, 11 pin
CBH-CB 264 LG: 2.40 ft WT: 24.3 lb OD: 2.244 in

Compact Swivel Head Adaptor
SHA-J.B 595 LG: 2.30 ft WT: 22.0 lb OD: 2.244 in

Compact Comms Gamma
MCG-D.K 443 LG: 8.70 ft WT: 63.9 lb OD: 2.244 in

Compact Micro-Resistivity
MMR-B.A 91 LG: 8.59 ft WT: 81.6 lb OD: 4.882 in

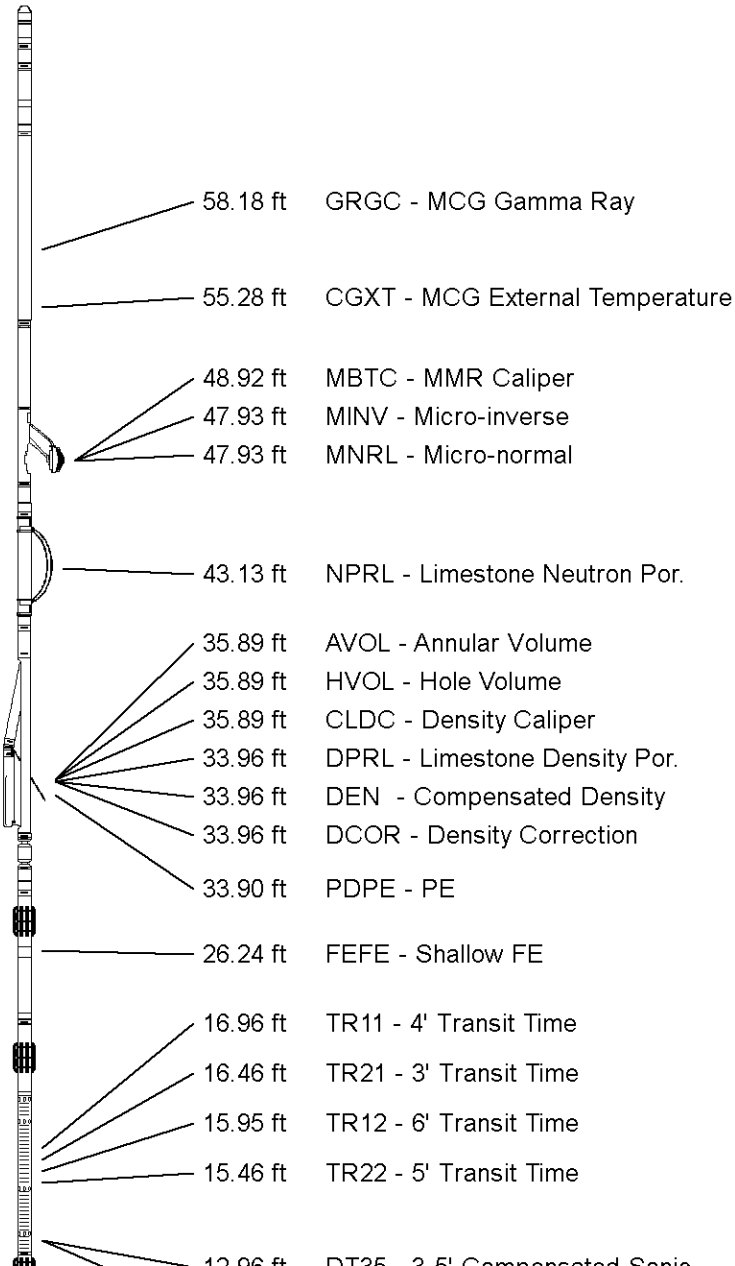
Compact Neutron
MDN-B.A 292 LG: 5.04 ft WT: 50.7 lb OD: 2.244 in

Compact Density/Caliper
MPD-C.A 216 LG: 9.59 ft WT: 90.4 lb OD: 2.913 in

Compact Knuckle Joint
SKJ-E.B 733 LG: 2.17 ft WT: 24.3 lb OD: 2.244 in

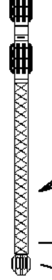
Compact Focussed Electric
MFE-B.J 352 LG: 6.05 ft WT: 48.5 lb OD: 2.244 in

Compact Sonic
MSS-C.K 319 LG: 12.52 ft WT: 72.8 lb OD: 2.244 in



Compact Induction
MAI-B.J 390 LG: 10.81 ft WT: 48.5 lb OD: 2.244 in

Total Length: 68.16 ft Weight: 526.9 lb



12.96 ft	DT35 - 3-5' Compensated Sonic
12.96 ft	SPRL - Wyllie Lime. Sonic Por.
3.34 ft	R40O - Array Ind. One Res 40
3.34 ft	RTAO - Array Ind. One Res Rt
3.34 ft	R60O - Array Ind. One Res 60
0.23 ft	SPCG - Spontaneous Potential
Tool Zero	(0.13ft from bottom)
-0.13 ft	SMTU - DST Uphole Tension

All measurements relative to tool zero.

COMPANY	MURFIN DRILLING COMPANY, INC.
WELL	MOONRAKER #6-27
FIELD	WILDCAT
PROVINCE/COUNTY	LINCOLN
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	5475	feet	First Reading		feet
Elevation Drill Floor	5473	feet	Depth Driller	8300.00	feet
Elevation Ground Level	5462	feet	Depth Logger	8303.00	feet

Weatherford®

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

Weatherford

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG

COMPANY	MURFIN DRILLING COMPANY, INC.
WELL	MOONRAKER #6-27
FIELD	WILDCAT
PROVINCE/COUNTY	LINCOLN
COUNTRY/STATE	U.S.A. / COLORADO
LOCATION	2300' FNL & 1500' FWL
SEC 27 TWP 10S RGE 56W	Other Services: MML
Latitude	39.150720 MPD/MDN
Longitude	-103.654100 MSS
API Number	05-073-06757
Permanent Datum GL, Elevation 5462 feet	Elevations: feet
Log Measured From KB, 13.00 feet above Permanent Datum	KB 5475.00
Drilling Measured From KB	DF 5473.00
	GL 5462.00

Date	20-JAN-2019	
Run Number	ONE	
Service Order	17876-235128055	
Depth Driller	8300.00	feet
Depth Logger	8303.00	feet
First Reading	---	
Last Reading	---	
Casing Driller	455.00	feet
Casing Logger	443.00	feet
Bit Size	7.875	inches
Hole Fluid Type	CHEMICAL	
Density / Viscosity	9.40 lb/USg	90.00 sec/qt
PH / Fluid Loss	10.50	8.00 ml/30Min
Sample Source	FLOWLINE	
Rm @ Measured Temp	0.76 @ 94.0	ohm-m
Rmf @ Measured Temp	0.57 @ 94.0	ohm-m
Rmc @ Measured Temp	0.91 @ 94.0	ohm-m
Source Rmf / Rmc	CALC	CALC
Rm @ BHT	0.40 @ 179.0	ohm-m
Time Since Circulation	5 HOURS	
Max Recorded Temp	179.00	deg F
Equipment / Base	13096	LIB
Recorded By	BANDAR BINOSFUR	
Witnessed By	GREGG SMITH	

1 INCH MAIN

Depth Based Data - Maximum Sampling Increment 10.0cm
Filename: C:\Minimus 18.03.9344\Data\Murfin Moonraker #6-27\MERGED MAIN PASS final.dta
System Versions: Plotted with 18.03.9344
Plotted on 20-JAN-2019 14:06
Recorded on 20-JAN-2019 03:03

Timing Marks
every 60.0 sec

Gamma Ray
API
0 75 150
150 225 300

Spontaneous Potential
millivolts
- →|25|← +

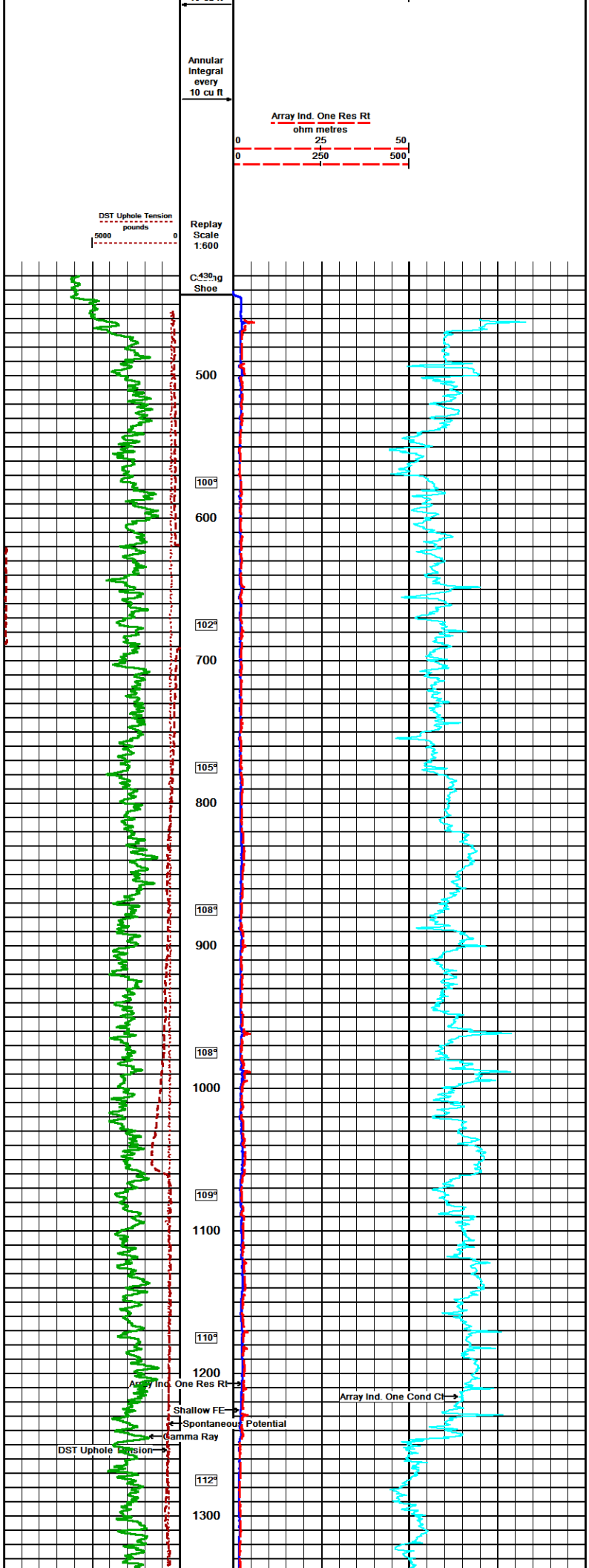
Depth In Feet

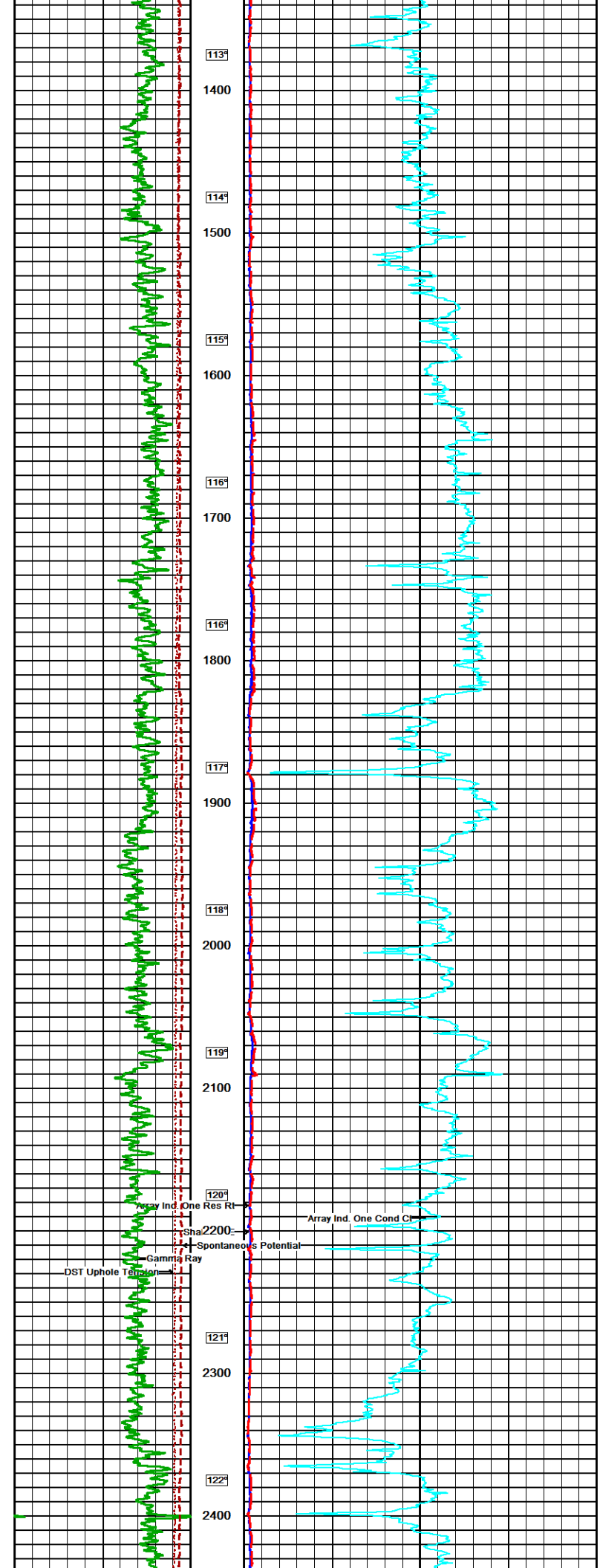
Borehole Temp in deg F

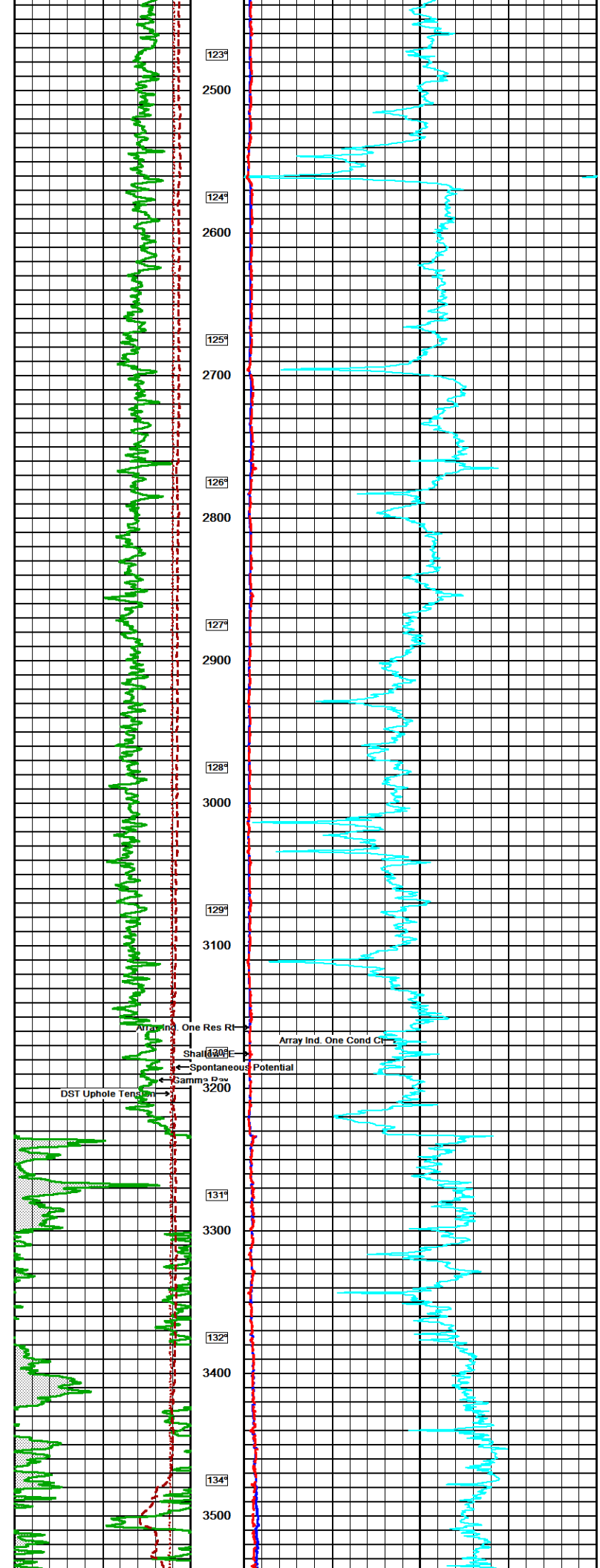
HVI every 10 cu ft

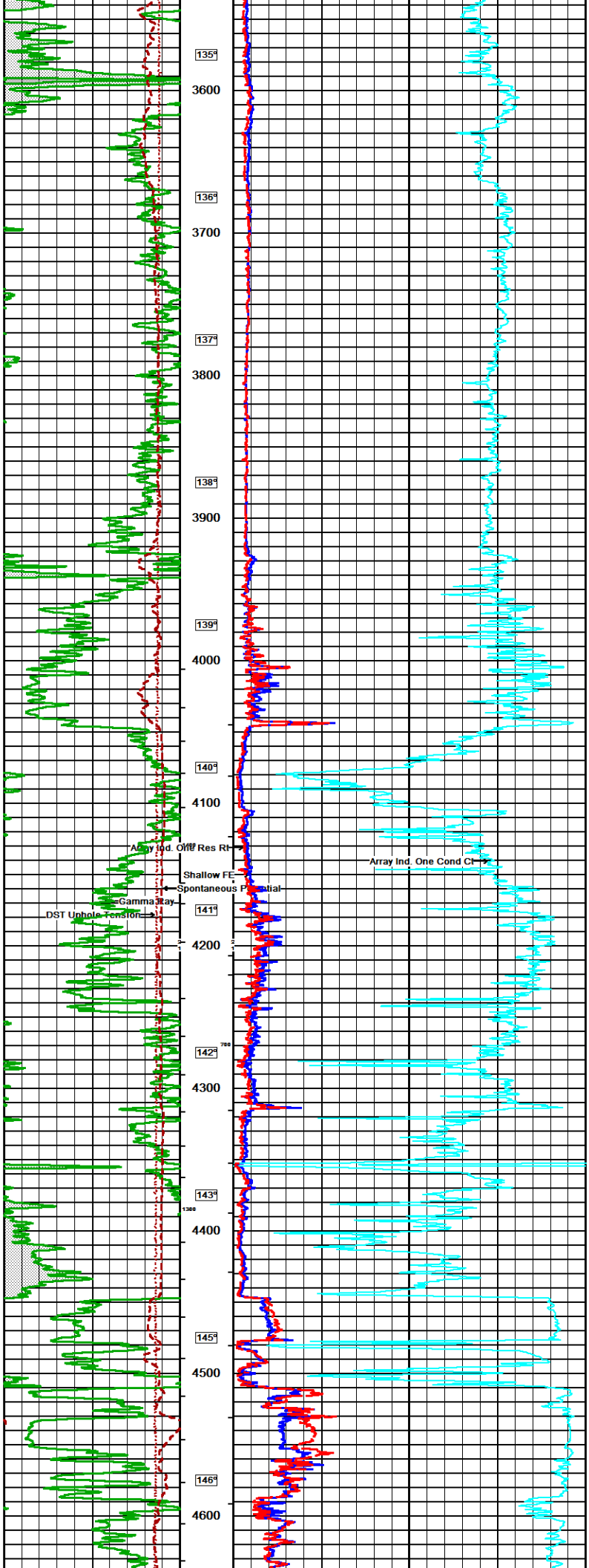
Array Ind. One Cond Ct
mmhos/metre
1000 750 500 250 0
2000 1750 1500 1250 1000

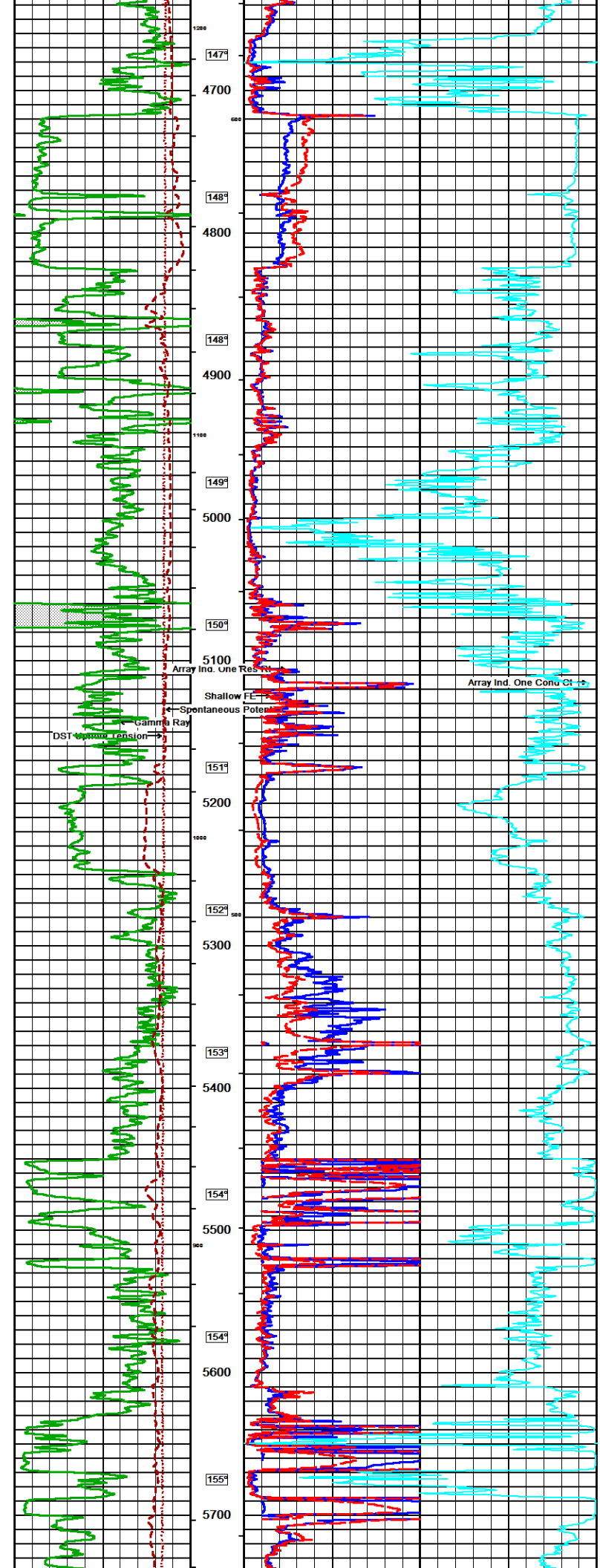
Shallow FE
ohm metres
0 25 50
0 250 500

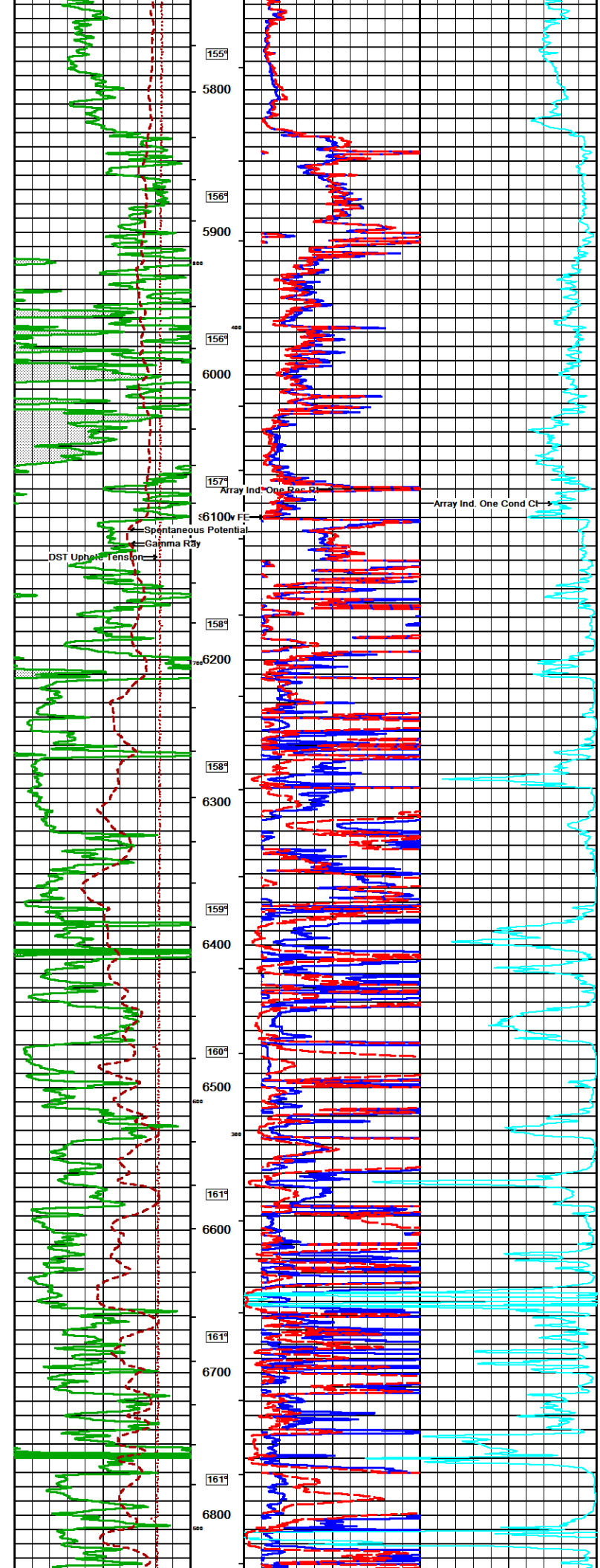

Annular Integral every 10 cu ft
Array Ind. One Res Rt
ohm metres
0
25
50
0
250
500
DST Uphole Tension
pounds
5000
0
Replay Scale 1:600
Casing Shoe
500
600
700
800
900
1000
1100
1200
1300
Array Ind. One Res Rt
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
Array Ind. One Cond Ct

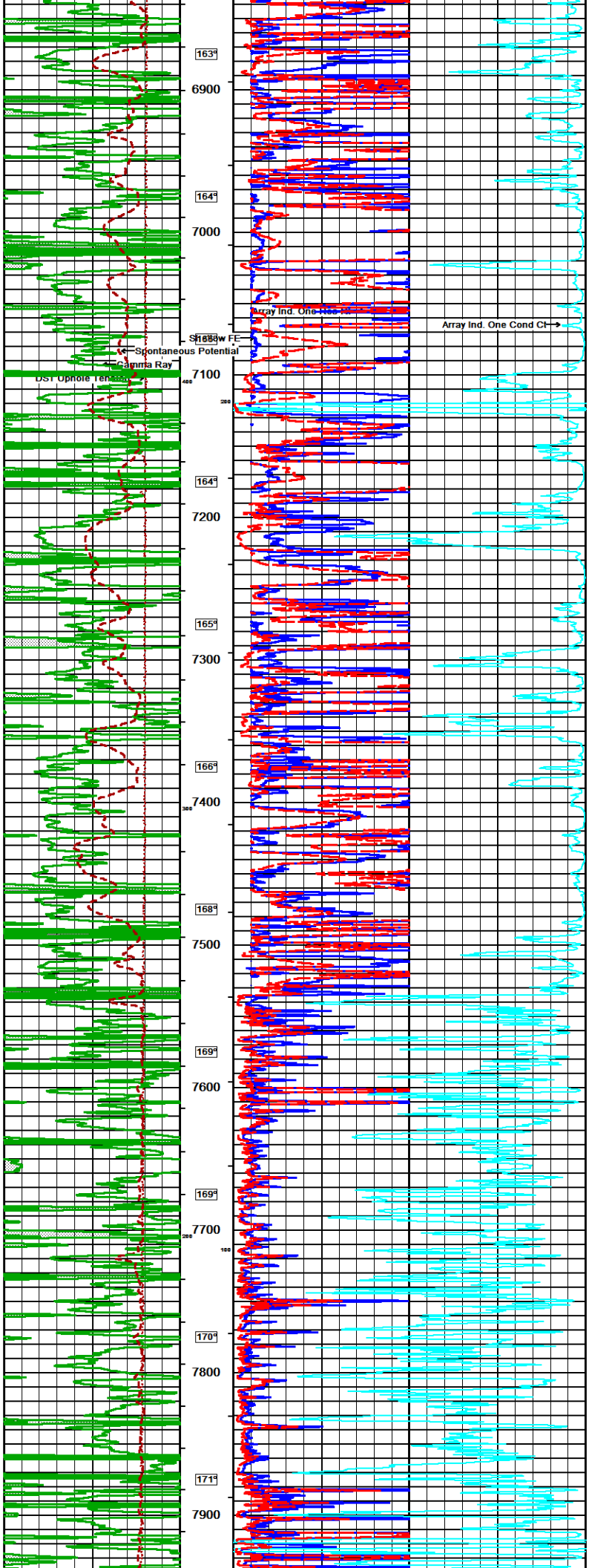

1400
1500
1600
1700
1800
1900
2000
2100
2200
2300
2400
Array Ind. One Res RI
Array Ind. One Cond CI
Spontaneous Potential
Gamma Ray
DST Uphole Tension

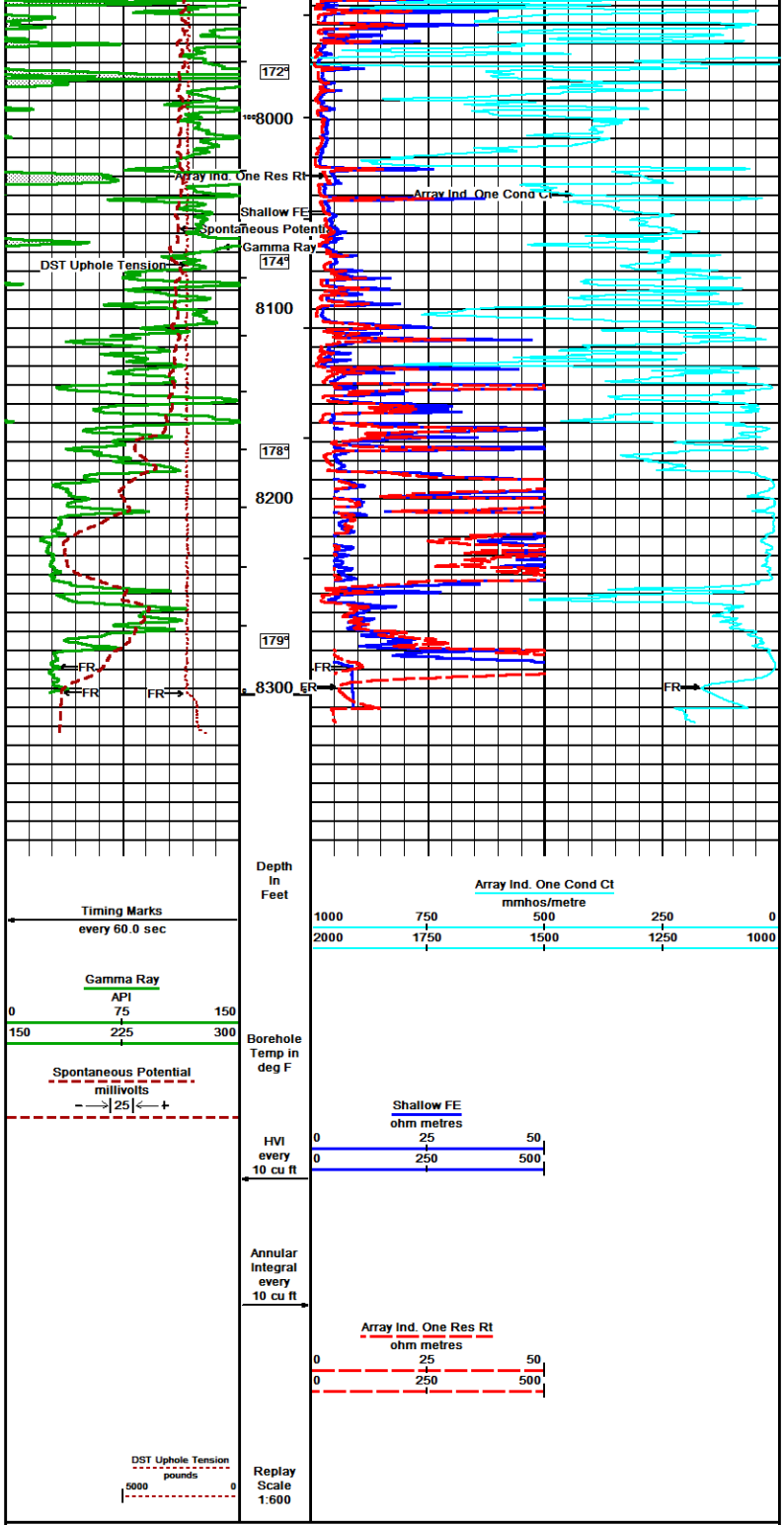

123°
2500
124°
2600
125°
2700
126°
2800
127°
2900
128°
3000
129°
3100
Array Ind. One Res Rt
Array Ind. One Cond Ct
Shallow Ct
Spontaneous Potential
Gamma Ray
DST Uphole Tension
3200
131°
3300
132°
3400
134°
3500


135°
3600
136°
3700
137°
3800
138°
3900
139°
4000
140°
4100
Array Ind. One Cond Cl
Shallow FE
Spontaneous Potential
Gamma Ray
DST Uphole Tension
141°
4200
142°
4300
143°
4400
145°
4500
146°
4600


4700
4800
4900
5000
5100
5200
5300
5400
5500
5600
5700
Array Ind. One Res Rt
Shallow FE
Spontaneous Poten
Gamma Ray
DST Upload Tension
Array Ind. One Conu Ct


5800
5900
6000
6100
6200
6300
6400
6500
6600
6700
6800
Array Ind. One Cond Ct
Spontaneous Potential
Gamma Ray
DST Uphole Tension


Array Ind. One Cond Ch
Spontaneous Potential
Gamma Ray
6900
7000
7100
7200
7300
7400
7500
7600
7700
7800
7900



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1 INCH MAIN

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WELL	MOONRAKER #6-27
FIELD	WILDCAT
PROVINCE/COUNTY	LINCOLN
COUNTRY/STATE	U.S.A. / COLORADO

Elevation Kelly Bushing	5475	feet	First Reading		feet
Elevation Drill Floor	5473	feet	Depth Driller	8300.00	feet
Elevation Ground Level	5462	feet	Depth Logger	8303.00	feet

Weatherford®

ARRAY INDUCTION
SHALLOW FOCUSED
ELECTRIC LOG