

**Tucker**  
ENERGY SERVICES

**DUAL INDUCTION  
RESISTIVITY LOG**

File No : TUL-57362  
Company : COBALT ENERGY LLC  
Well : BROBST "A" #1-7  
Field :  
Country : ROOKS  
State : KANSAS  
Country : USA  
API No : 15-163-24025-0000

Company : COBALT ENERGY LLC  
Well : BROBST "A" #1-7  
Field :  
Country : ROOKS  
State : KANSAS  
Country : USA  
API No. : 15-163-24025-0000

Location :  
660' FSL 660' FEL  
SE SE

LSD : Sect : 7 Twp : 6S Rge : 19W

Permanent Datum: GL Elevations: KB 2117.00 Ft GRT XYT  
Drilling Measured From: KB DF 2116.00 Ft CNT PTT  
Log Measured From: KB GL 2107.00 Ft LDT  
Above Permanent Datum: 10.00 Ft

Date	2012-08-07	
Run Number	1	
Depth--Driller	3630.0	Ft
Depth--Logger	3629.0	Ft
First Reading	3628.0	Ft
Last Reading	390.0	Ft
Casing--Driller	397.0	Ft
Casing--Logger	390.0	Ft
Bit Size	7.875	In
Casing Size	8.625	In
Hole Fluid Type	WBM	
Density	9.2 LBS/GAL	
Fluid Loss	7.6	CC
PH/Viscosity	10.0	58.0 SEC
Sample Source	MEASURED	
RM@Measured Temp.	0.900	@ 65 F
RMF@Measured Temp	0.670	@ 65 F
RMC@Measured Temp.	1.130	@ 65 F
Source RMF/RMC	CALCULATED/CALCULATED	
RM@BHT	0.540	@ 112 F
Time Circulation Stopped	2012-08-07 05:30	
Max Recorded Temp.	112	F
Equipment/Base	TRUCK 119	TULSA
Recorded By	R. FRANKLIN/ C. PAYNE	
Witnessed By	R. HENDRIX	

The customer is hereby warned that by providing the log data herein, T. E. S. does not agree to provide any interpretation of log data, conversion of log data to physical rock parameters or recommendations. T. E. S. does not guarantee or warrant either expressly or impliedly, the accuracy of any interpretation of log data, conversion of log data to physical rock parameters or recommendations which may be given by T. E. S. personnel. Any interpretation, conversion or recommendation is not part of the consideration for the agreement between the parties and is not part of any part of the charge by T. E. S. for its services. Any user of the log data is warned that said user is not entitled to rely on interpretations, conversions or recommendations as aforesaid.

Bitsize Intervals		Casing Strings		
Size (In)	Bottom (Ft)	Size (In)	Weight (Lbs)	Bottom (Ft)
7.875	3630.00	8.625	24.00	397.00

Run Number	1	
Date	2012-08-07	
Date/Time On Bottom	2012-08-07 09:30	
Depth to Fluid	0.0	Ft
Salinity	1100.000	PPM
RMF@BHT	0.400	@ 112 F
RMC@BHT	0.670	@ 112 F

Run Number 1

Comments

ALL PRESENTATIONS AS PER CUSTOMER REQUEST  
 GRT, CNT, LDT AND PIT RUN IN COMBINATION.  
 CALIPERS ORIENTED ON X-Y AXIS.  
 2.71 G/CC USED TO CALCULATED POROSITY.  
 ANNULAR HOLE VOLUME CALCULATED USING 4.500" PRODUCTION CASING.

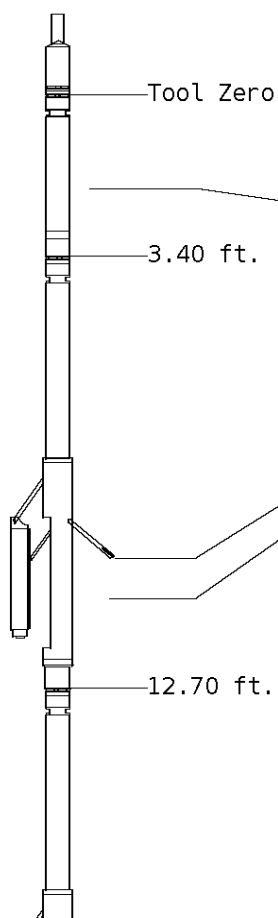
DETAIL ON 5 INCH INDUCTION RAN TO 3100' PER CUSTOMER REQUEST  
 DETAIL RAN TO 3100' ON DENSITY-NEUTRON LOG PER CUSTOMER REQUEST.

GRT: GRP.  
 CNT: PHIN, CLCNIN  
 LDT: PORL, LCORN, PECLN, LDENN, PORLLS, CLLDIN.  
 PIT: ILD, ILM, SPU, SFLAEC

OPERATORS:  
 J. THOMAS  
 M. RUBY

### Tool String Schematic

**Total Tool Length** - 43.49 ft.  
**Maximum Outside diameter** - 4.80 in.  
**Net Weight in Air** - 743.00 lbs.



**Tool:** GRT-B      **Length:** 3.40 ft.    **O.D.** 3.60 in.  
 Gamma Ray Controller

**Sonde ID** : GRT-BA-14

Measure Point	Tool Offset	Stack Offset	Bottom Offset
GRP	2.00	2.00	41.49

**Tool:** CNT-AA      **Length:** 9.30 ft.    **O.D.** 4.36 in.  
 Compensated Neutron A Pad on NDT-A

**Sonde ID** : NDT-BB-123

**Source ID** : N-1045

**Pad ID** : CNP-AA-024

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLCN	6.00	9.40	34.09
PHIN	6.80	10.20	33.29

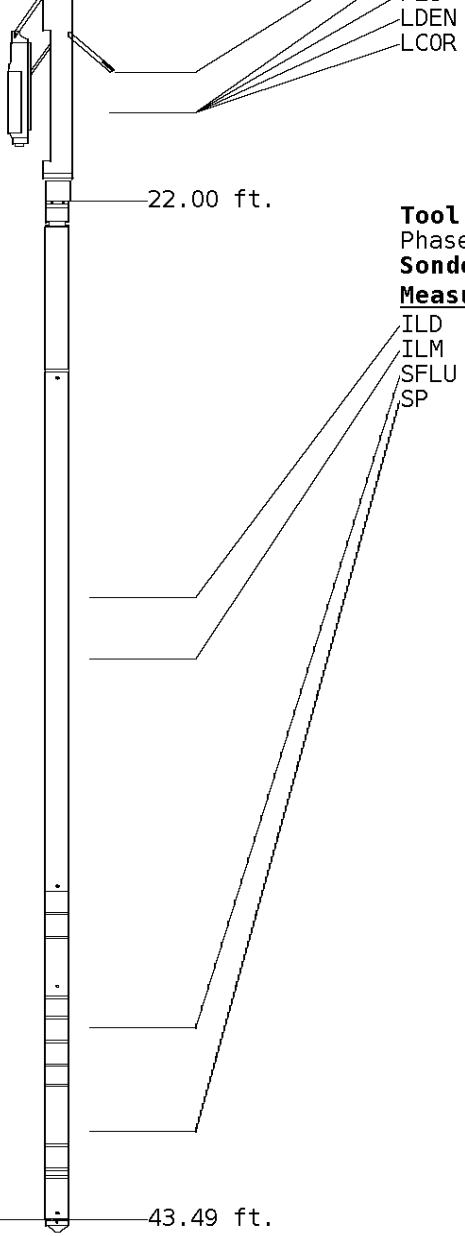
**Tool:** LDT-DA      **Length:** 9.30 ft.    **O.D.** 4.80 in.  
 Litho Density D Pad on NDT-A

**Sonde ID** : PDT-GA-464

**Source ID** : 2991GW

**Pad ID** : LDP-DA-065

Measure Point	Tool Offset	Stack Offset	Bottom Offset
CLLD	6.00	18.70	24.79
PEL	7.00	19.70	23.79
PES	7.40	20.10	23.39



7.20 19.90 23.59  
 7.20 19.90 23.59

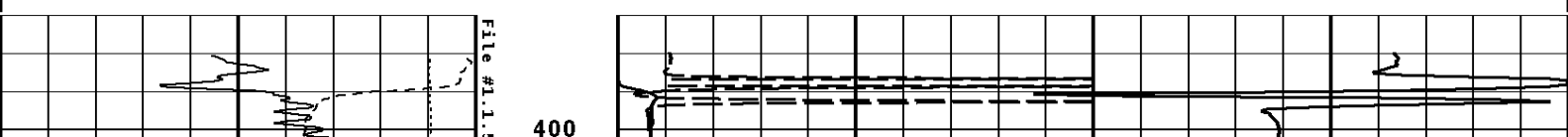
**Tool:** PIT-CA      **Length:** 21.49 ft.    **O.D.** 3.62 in.  
 Phased Dual Induction w/ RM & D  
**Sonde ID** :PIT-AC-22

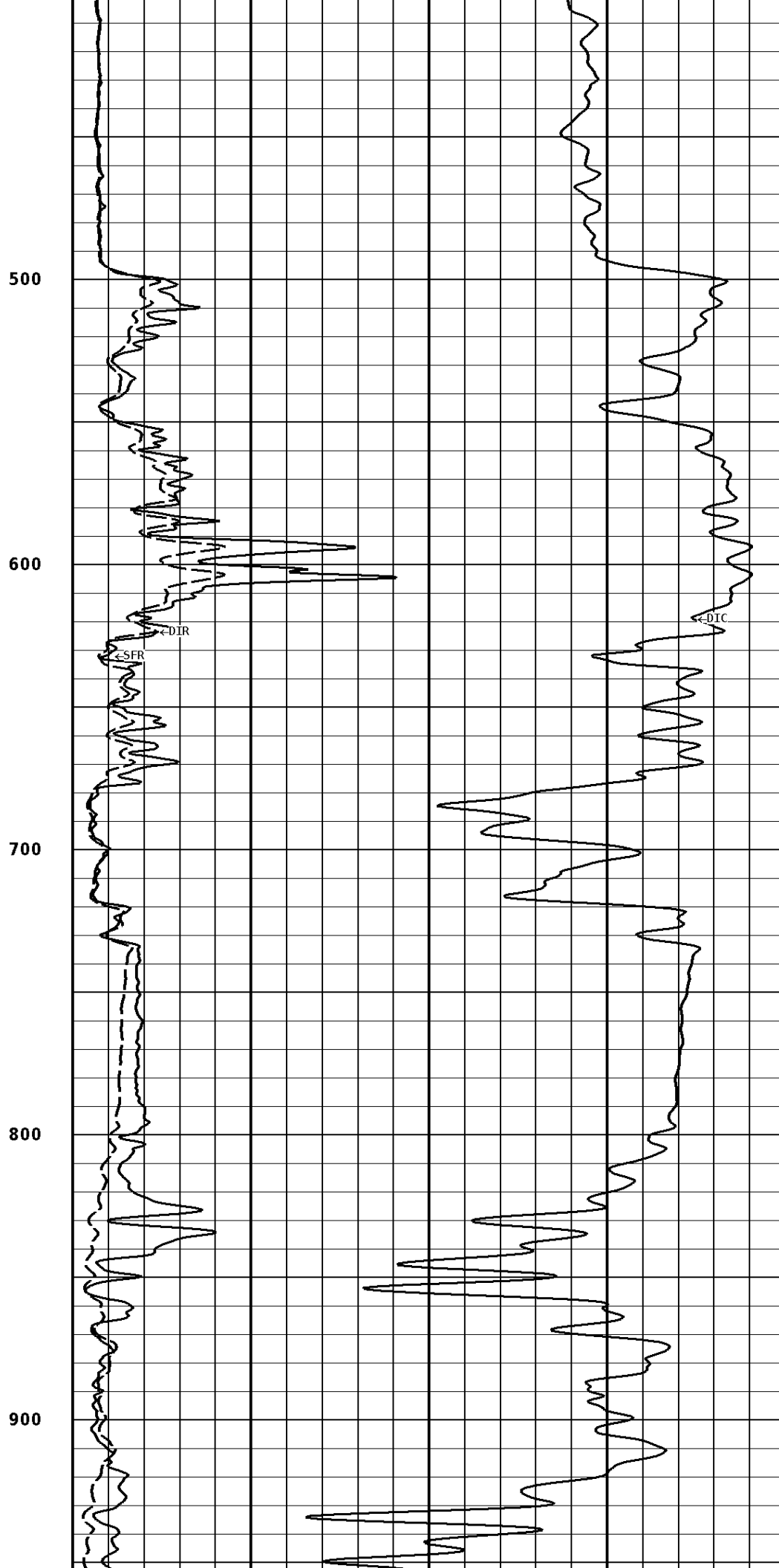
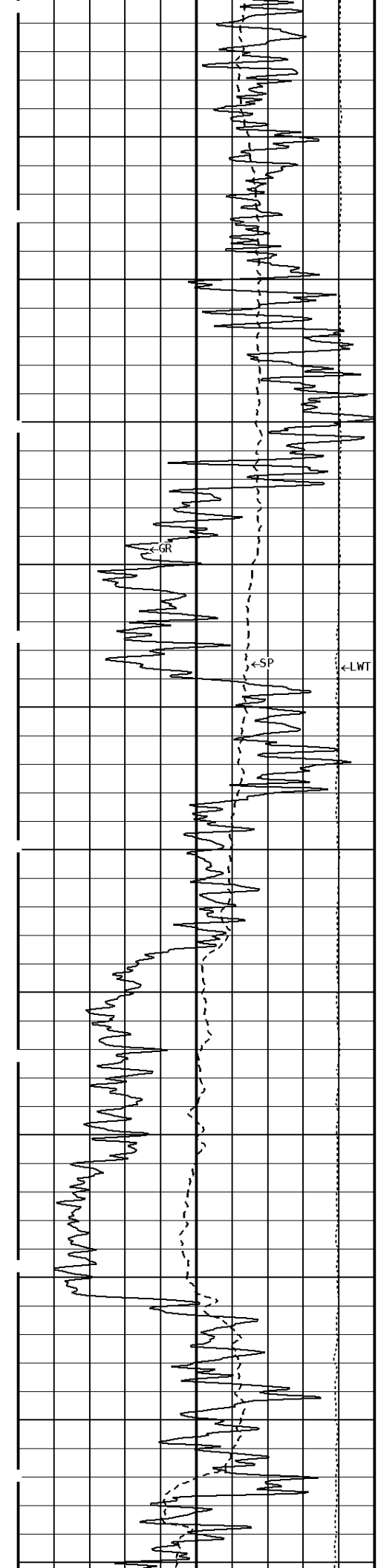
Measure Point	Tool Offset	Stack Offset	Bottom Offset
ILD	8.92	30.92	12.56
ILM	10.10	32.10	11.39
SFLU	17.49	39.49	4.00
SP	20.60	42.60	0.88

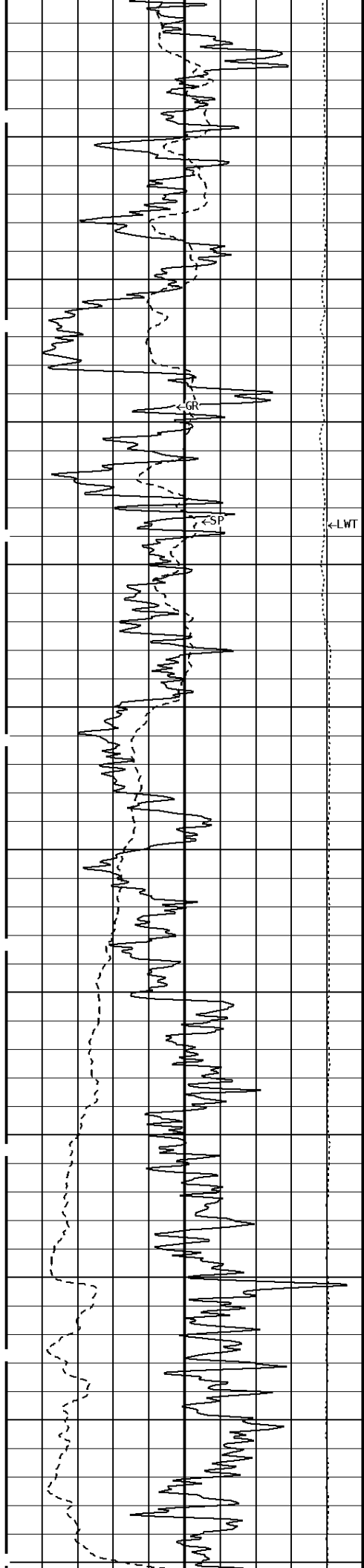
**Well File:** COBALT BROBST1-7 AUG7 STK      **Scale:** 1:600  
**Segment:** V1.D1.S5 FNL MN      **Acquired:** 2012-08/07 09:46 3.2.0-11172  
**Reference:** 0      **Processed:** 2012-08/07 10:49 3.2.0-11172

<b>TENSION</b> LBS 10000      0	<b>SHALLOW FOCUSED RESISTIVITY</b> OHMM 0.0      500.0 0.0      50.0	
<b>SPONTANEOUS POTENTIAL</b> mV →   ← 20	<b>DEEP INDUCTION</b> OHMM 0.0      500.0 0.0      50.0	
<b>GAMMA RAY</b> API UNITS 150      300 0      150	<b>DEEP CONDUCTIVITY</b> MMHO 2000      1000 1000      0	

**1:600 SECTION**  
2 INCH







1000

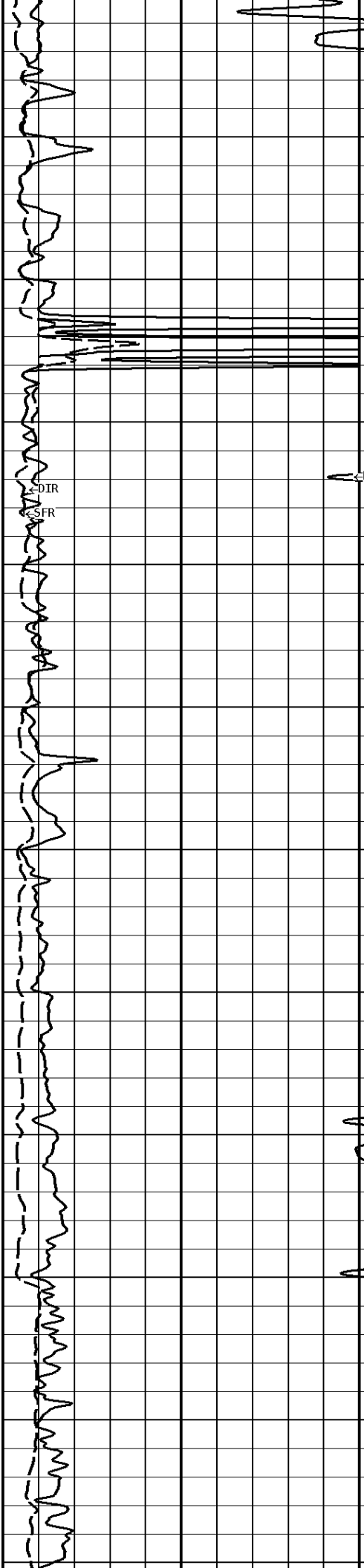
1100

1200

1300

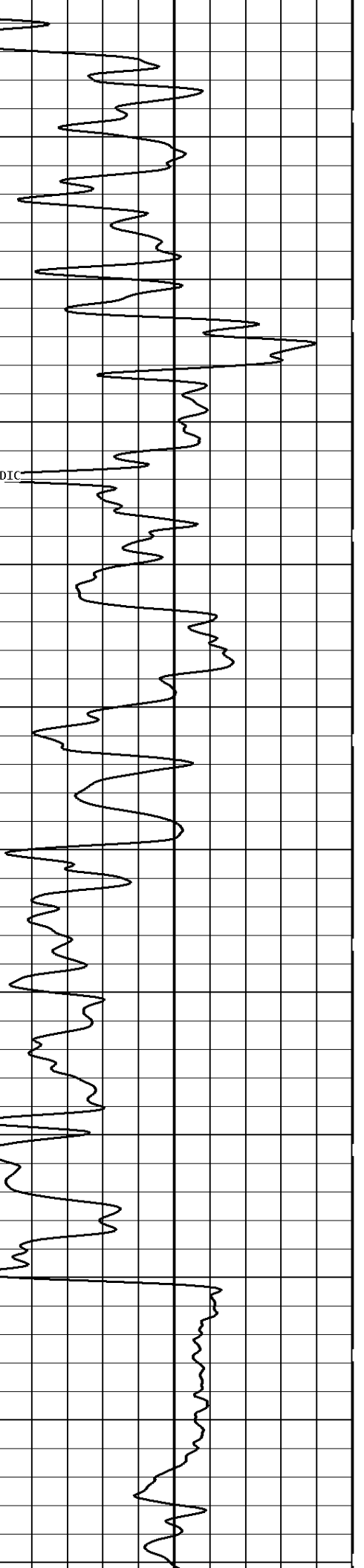
1400

1500

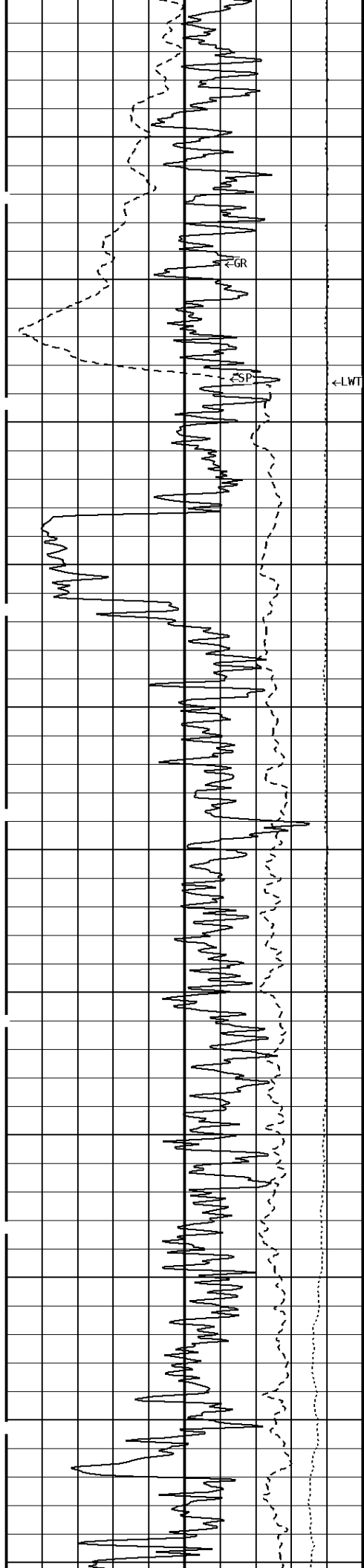


DIR

SFR



DIC



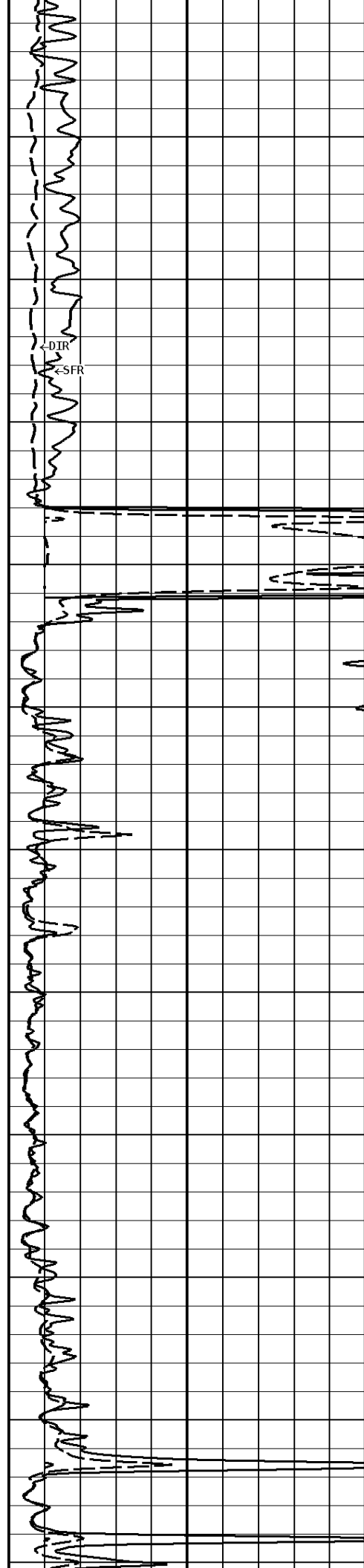
1600

1700

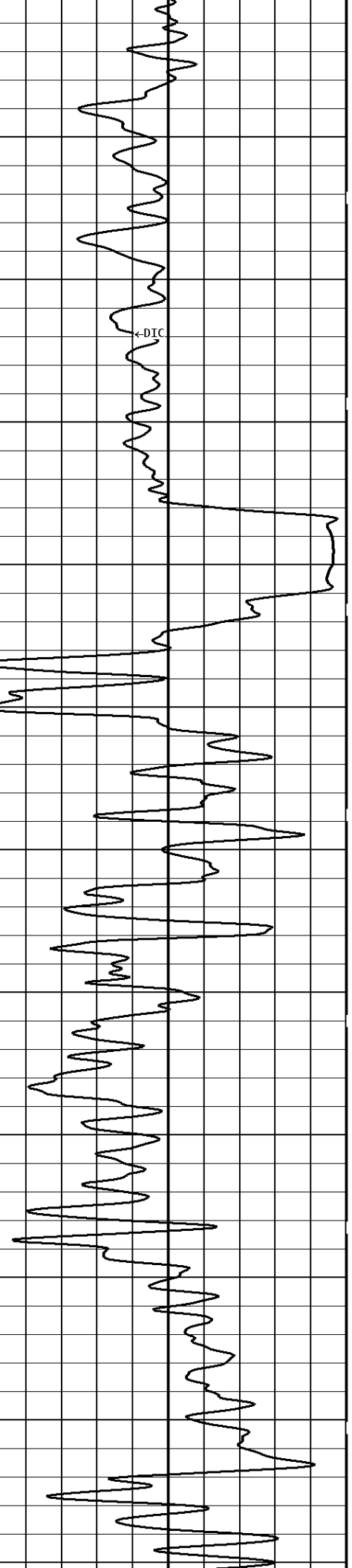
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1900

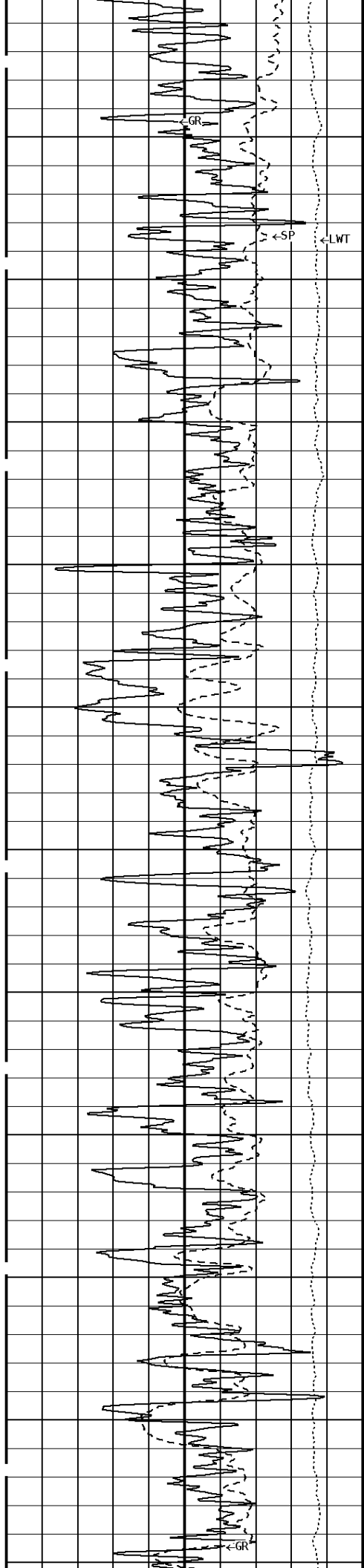
2000



←DIR  
←SFR



←DIC



2100

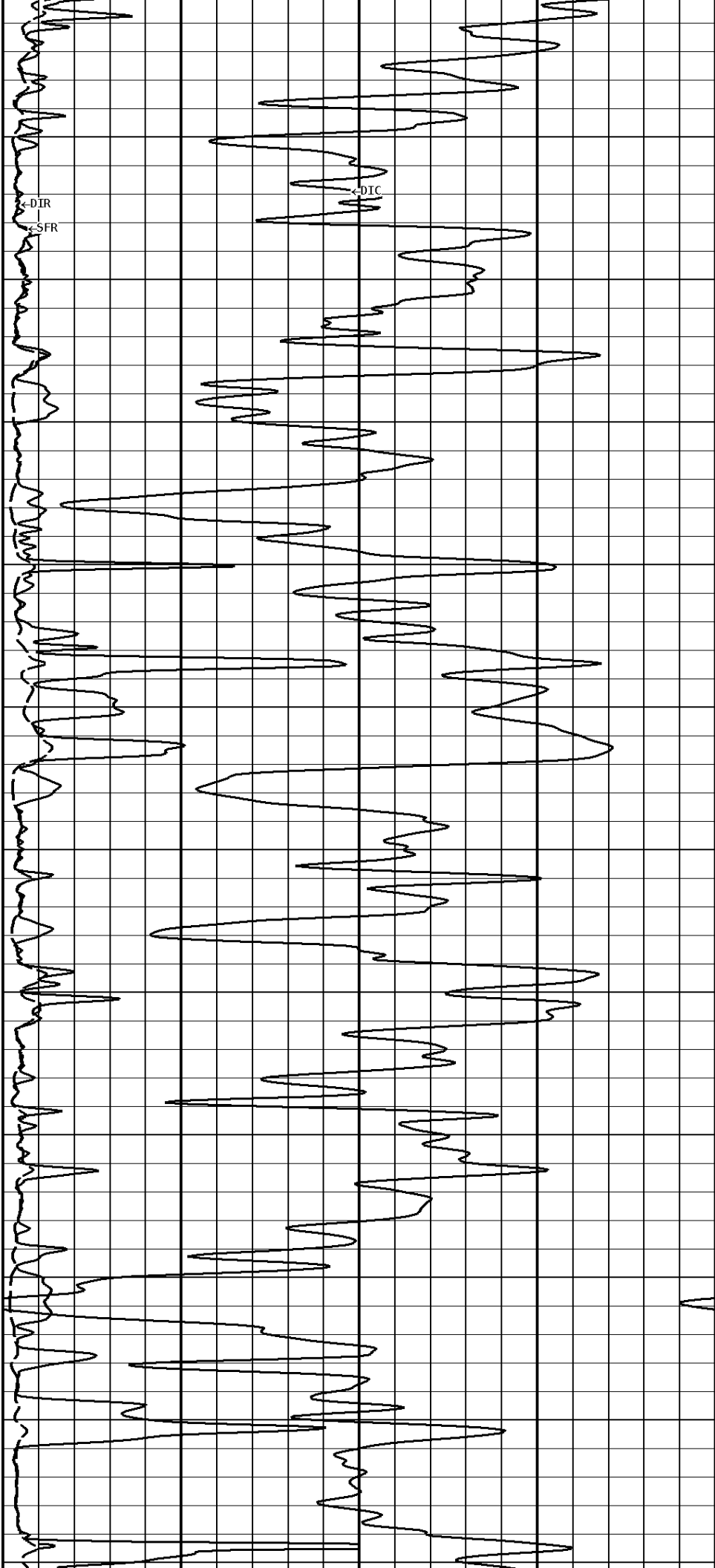
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2300

2400

2500

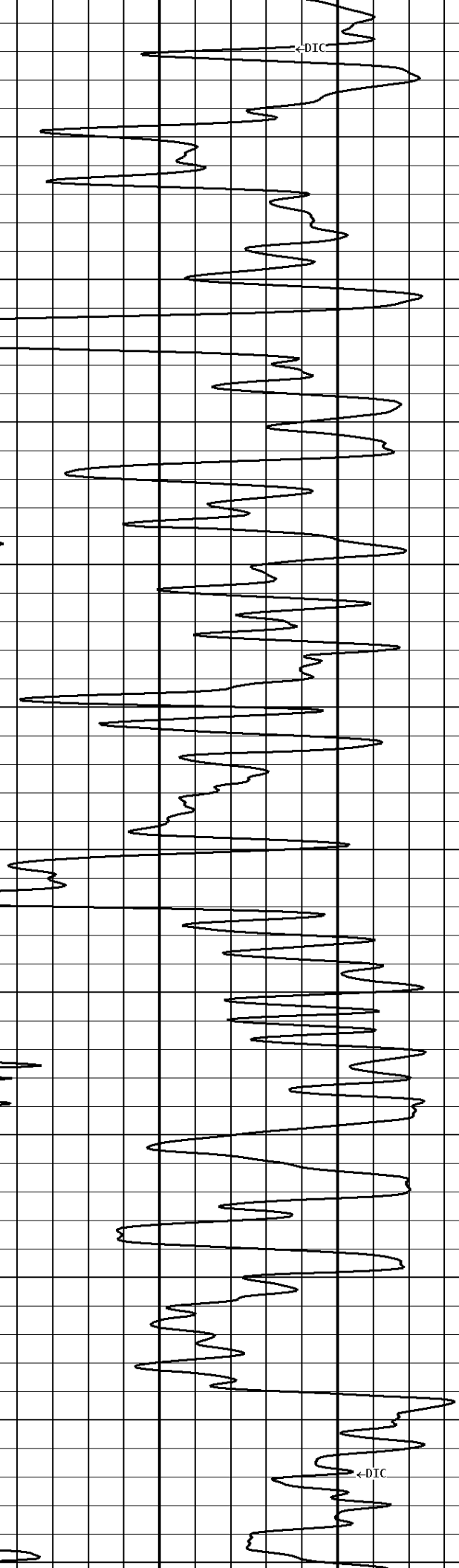
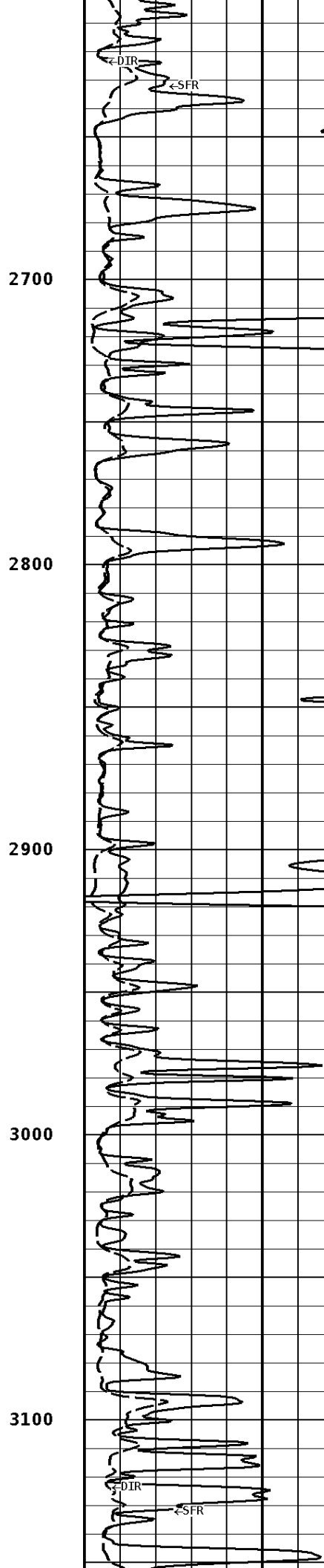
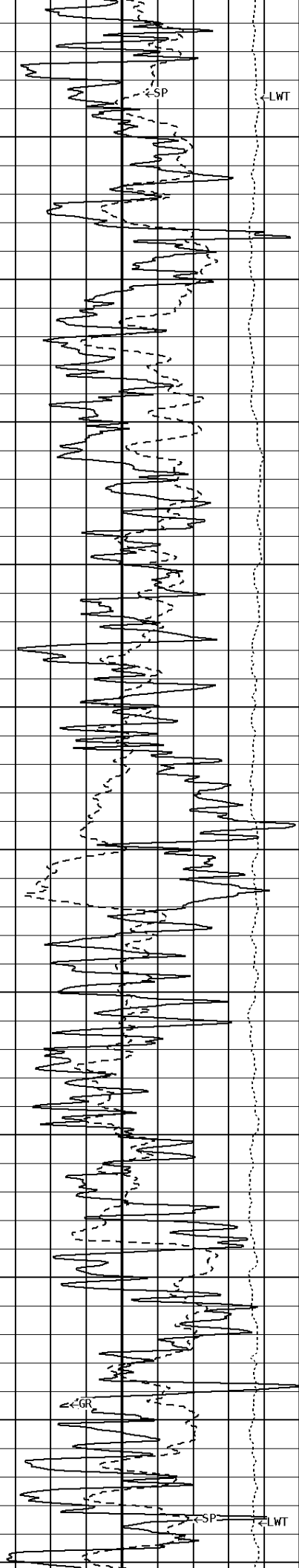
2600



←DIR

←SFR

←DIC



2700

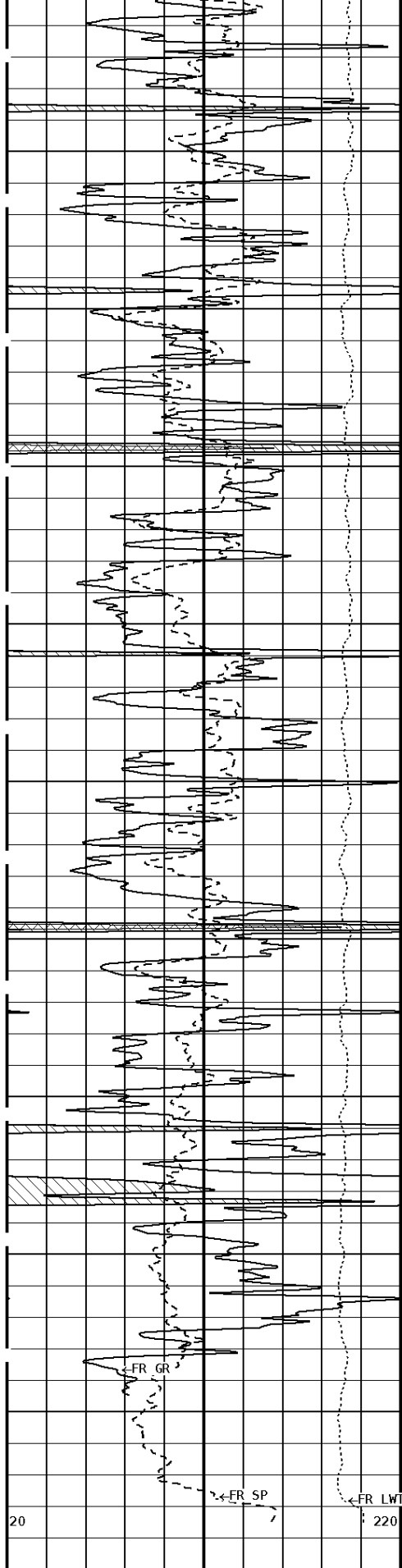
2800

2900

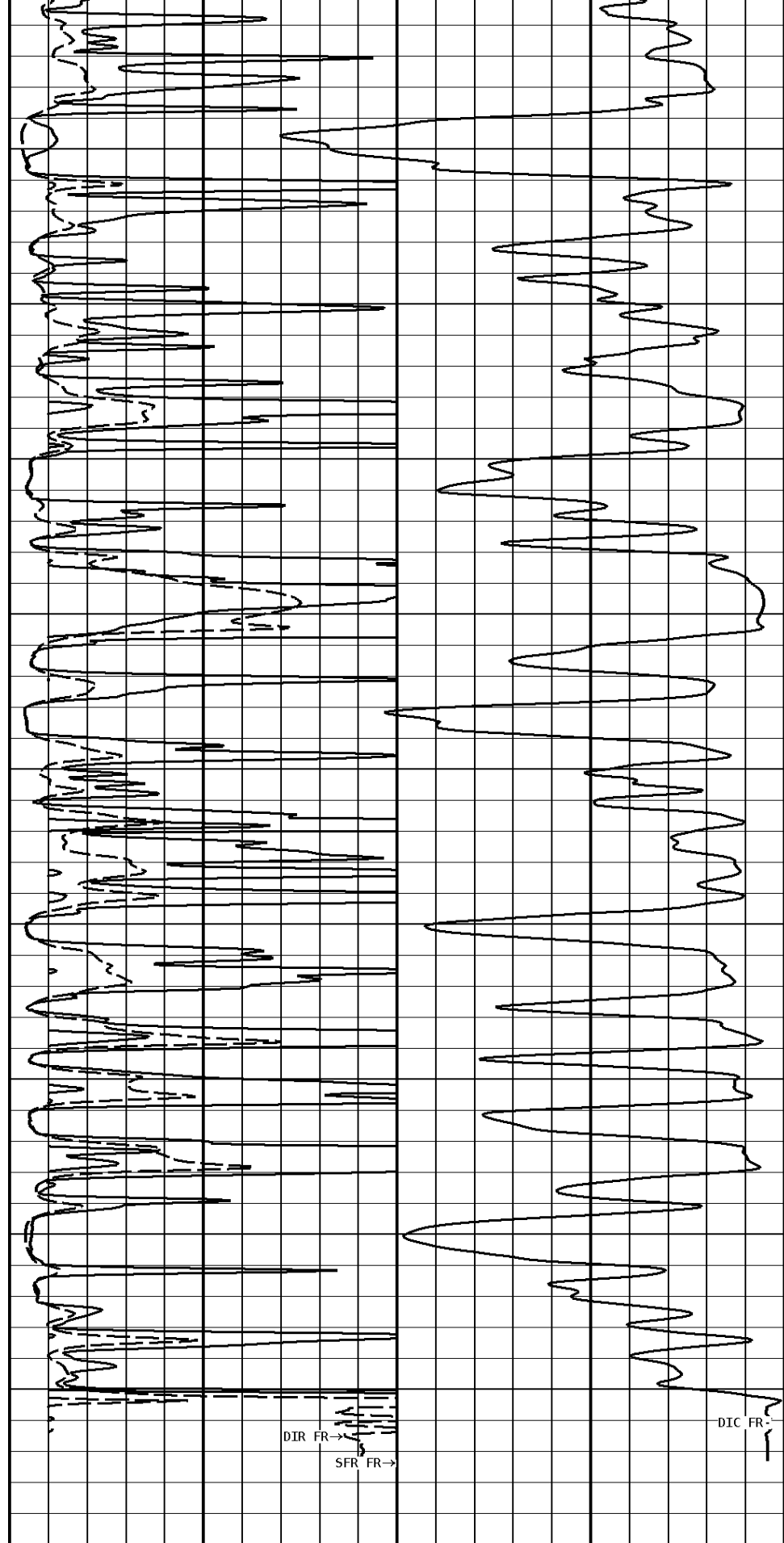
3000

3100





3200  
3300  
3400  
3500  
3600  
3629



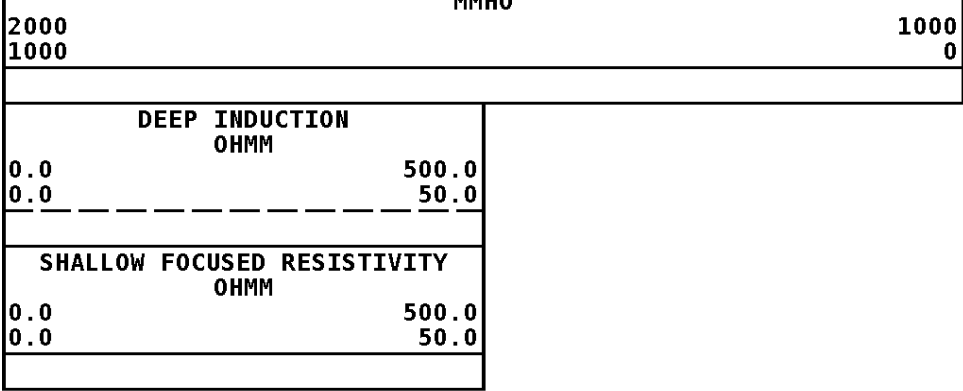
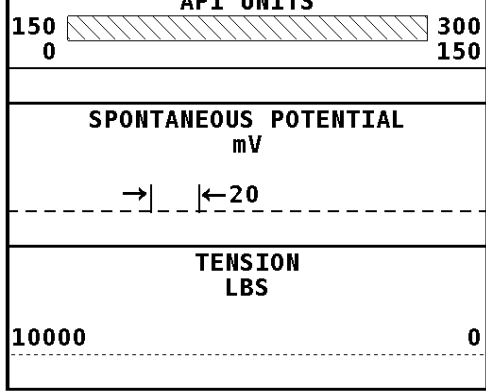
20  
FR GR  
FR SP  
FR LWT  
220  
File #1.1.5

DIR FR →  
SFR FR →  
DIC FR →

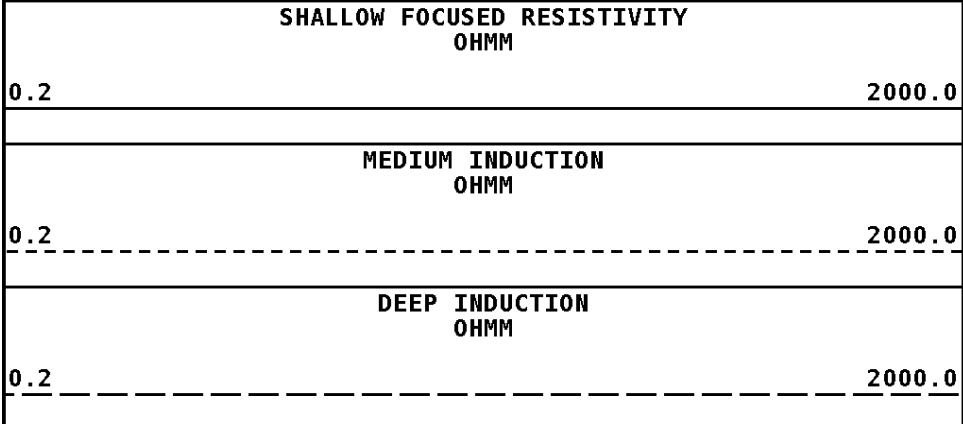
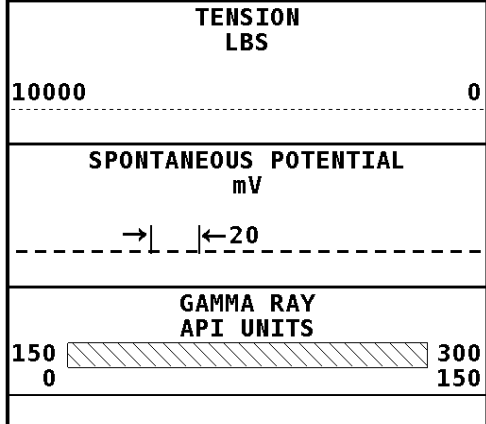
**1:600 SECTION**  
2 INCH

**GAMMA RAY**  
ART UNITS

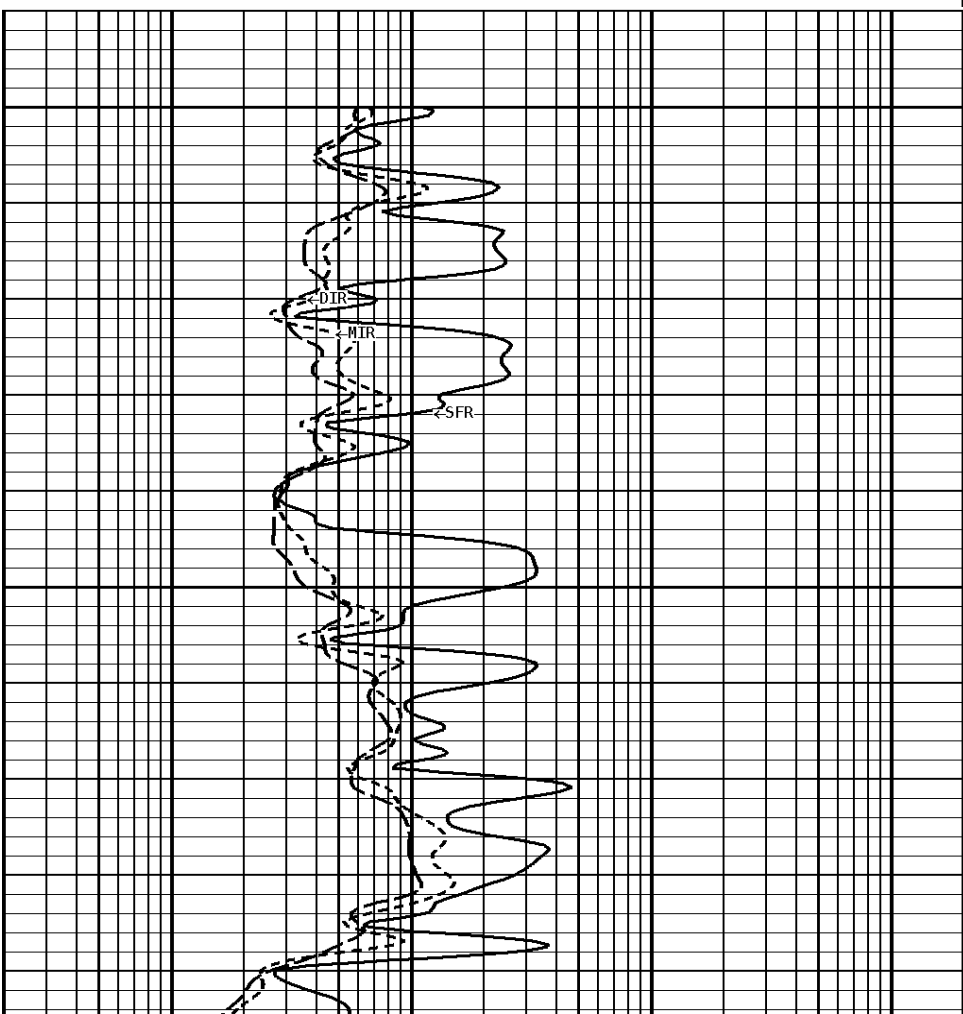
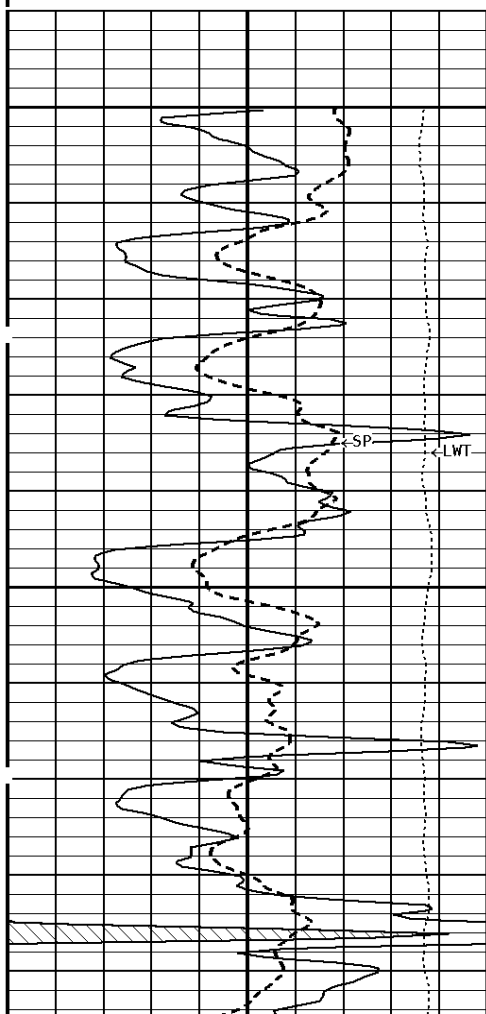
**DEEP CONDUCTIVITY**  
MMHO



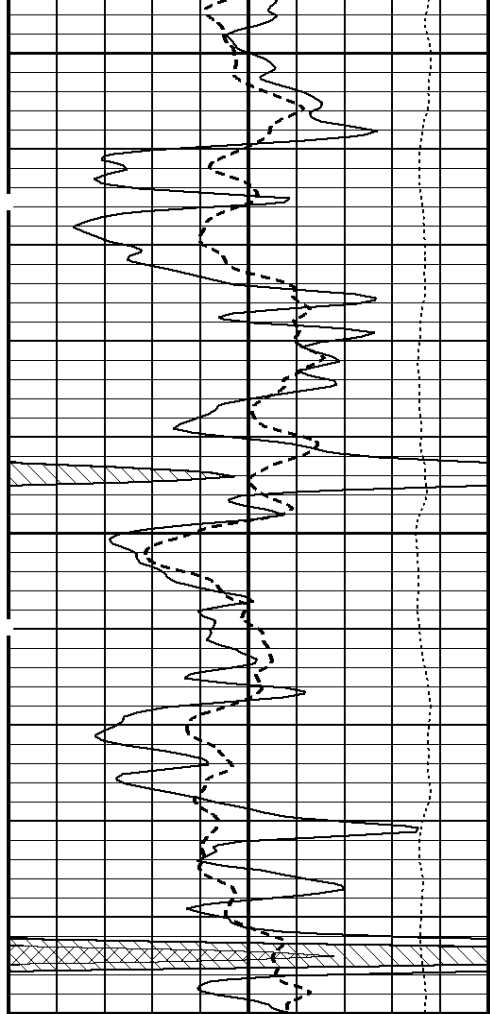
Well File: COBALT BROBST1-7 AUG7 STK Scale: 1:240  
 Segment: V1.D1.S5 FNL MN Acquired: 2012-08/07 09:46 3.2.0-11172  
 Reference: 0 Processed: 2012-08/07 10:49 3.2.0-11172



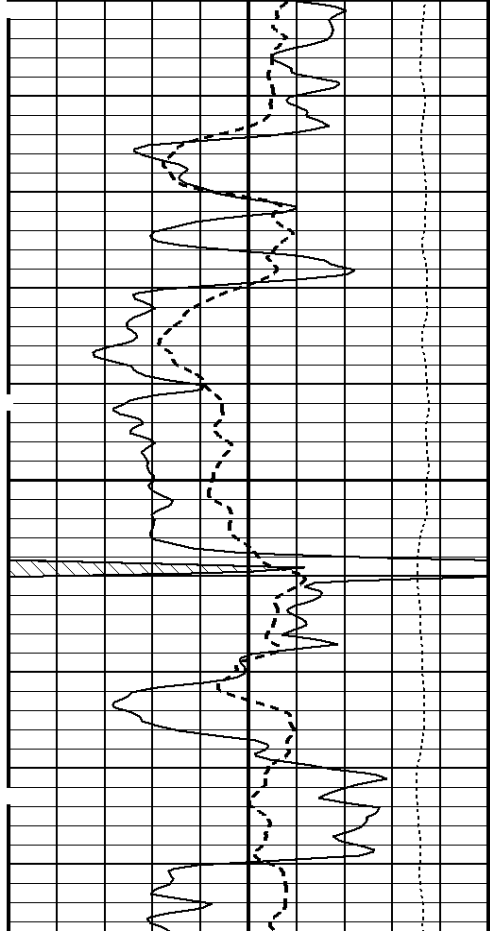
1:240 MAIN SECTION



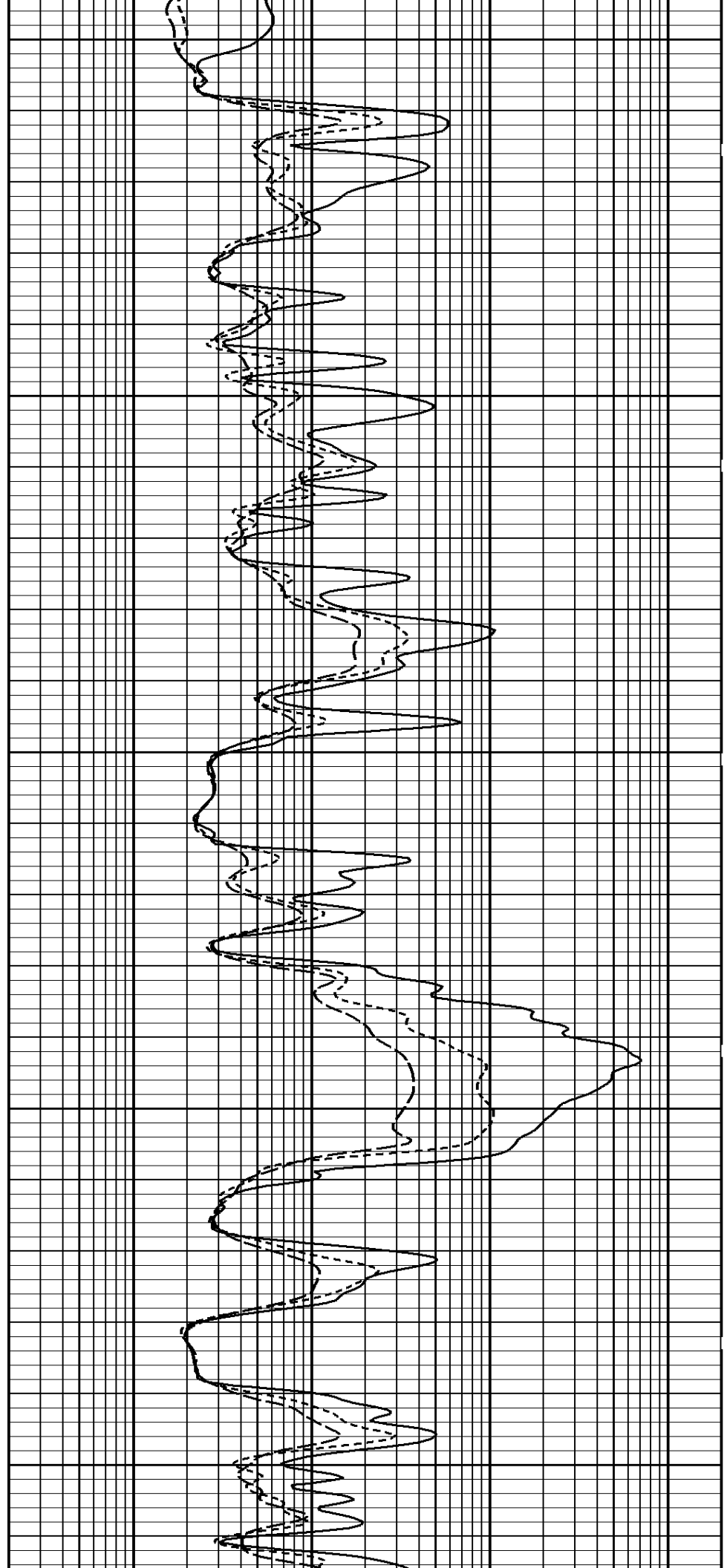
3200

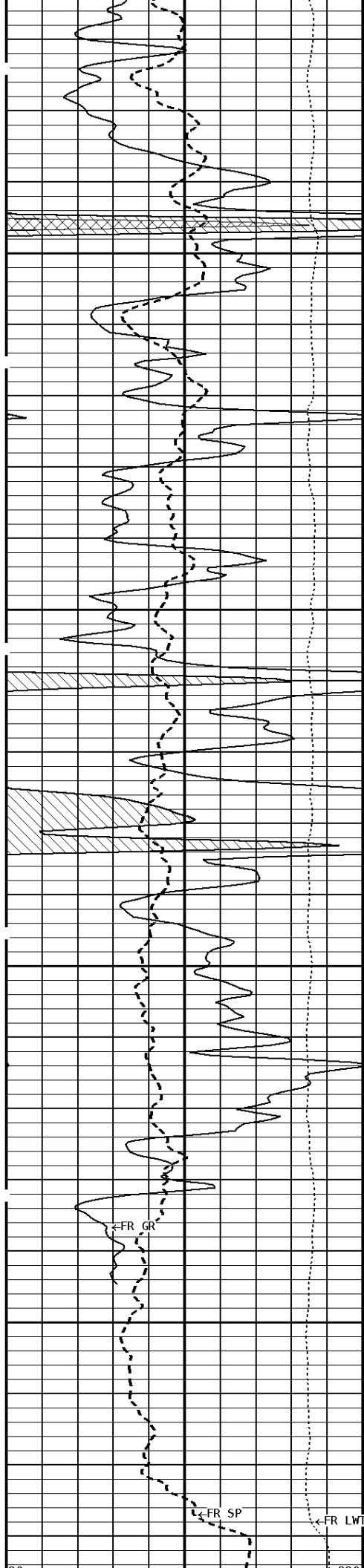


3300



3400

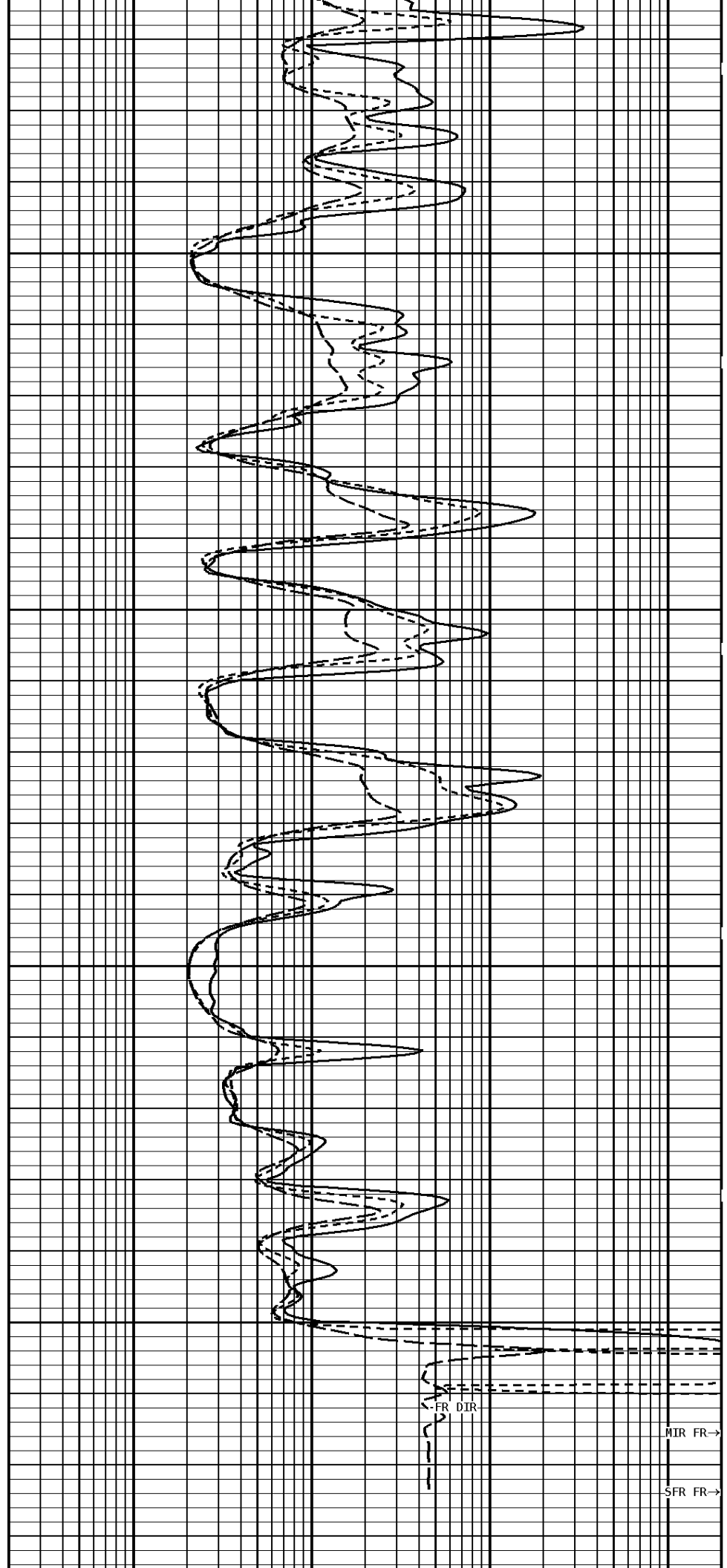


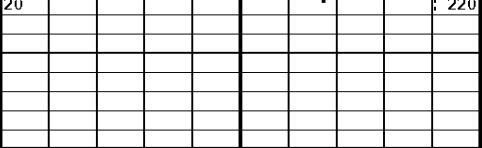


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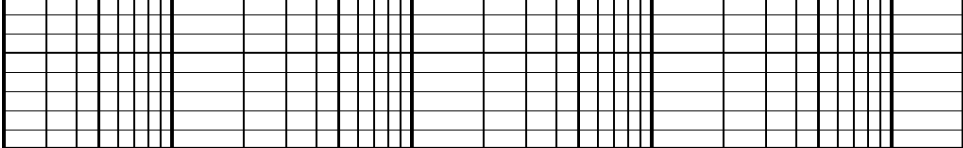
3600

3629

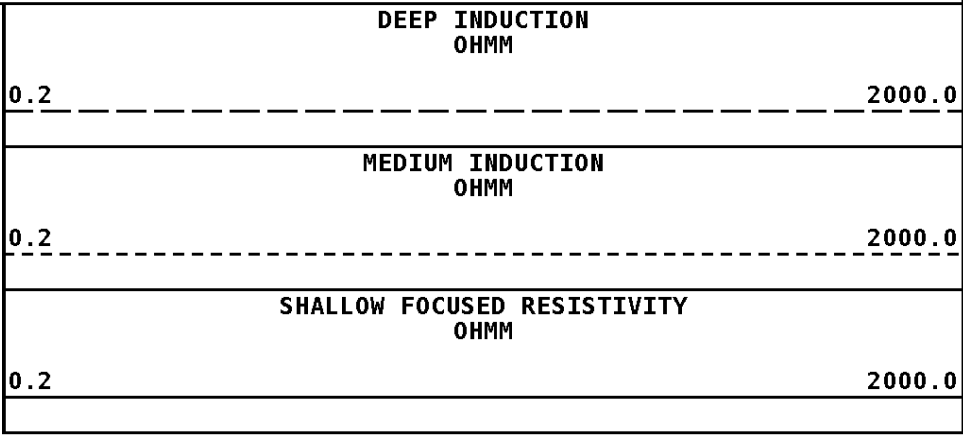
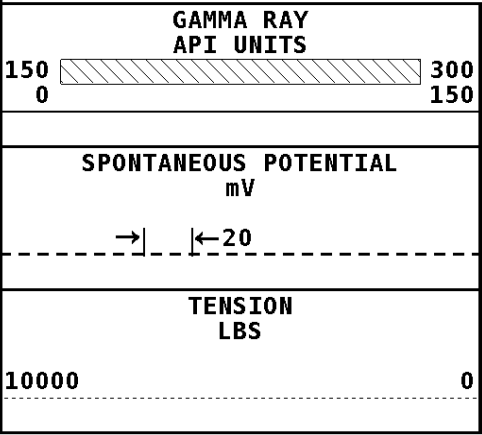




File #1.1.5



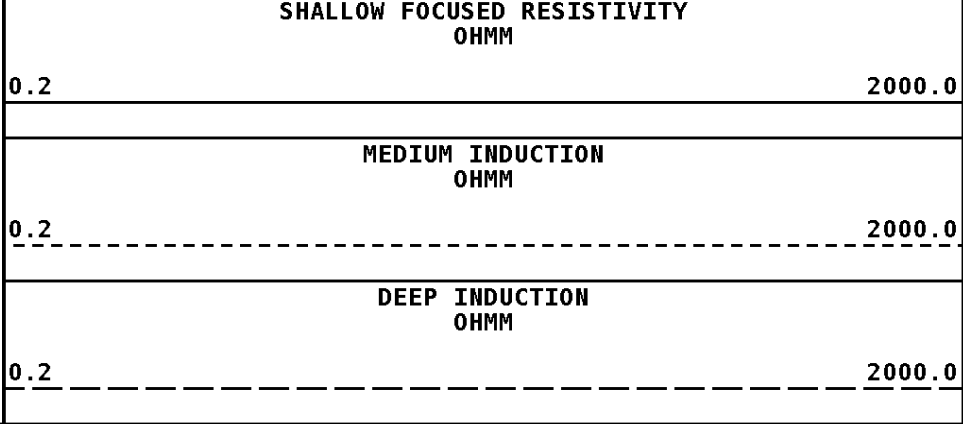
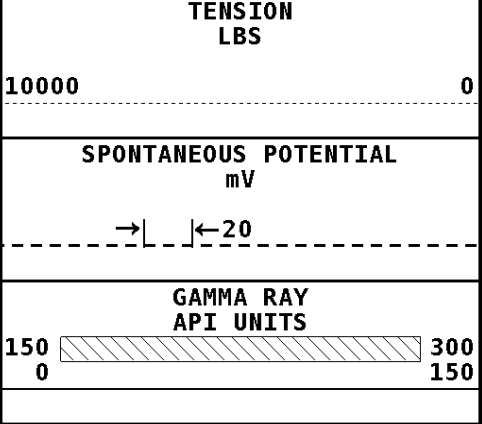
### 1:240 MAIN SECTION



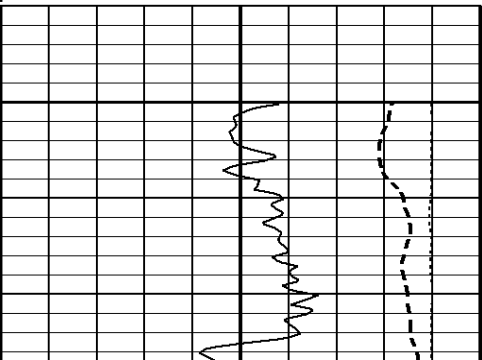
\* Borehole Zone Factors \*

<b>Zone 1    99999.0    to    0.0    Feet</b>
Drill Bit Size _____ 7.875 in BHT Depth _____ 3630.000 ft Borehole Temperature _____ 112.0 degF Temperature Gradient _____ 1.00 DFHF Resistivity Of Mud _____ 0.900 ohm/m Resistivity Of Mud Temperature _____ 65.00 degF

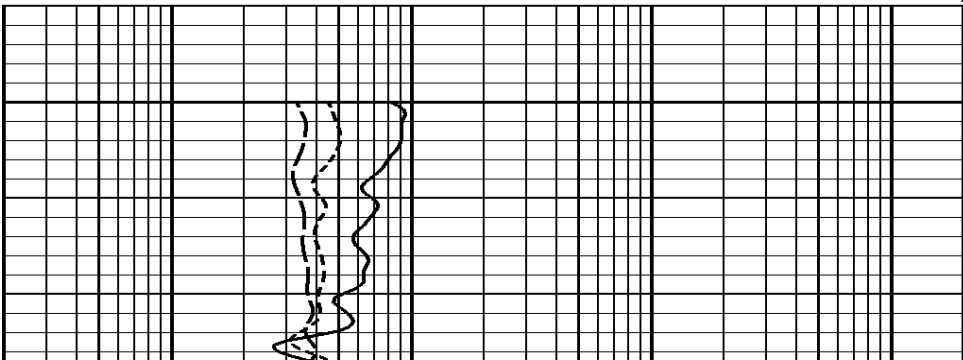
<b>Well File:</b> COBALT BROBST1-7 AUG7 STK <b>Segment:</b> V1.D1.S5 FNL MN <b>Reference:</b> 0	<b>Scale:</b> 1:240 <b>Acquired:</b> 2012-08/07 09:46 3.2.0-11172 <b>Processed:</b> 2012-08/07 10:49 3.2.0-11172
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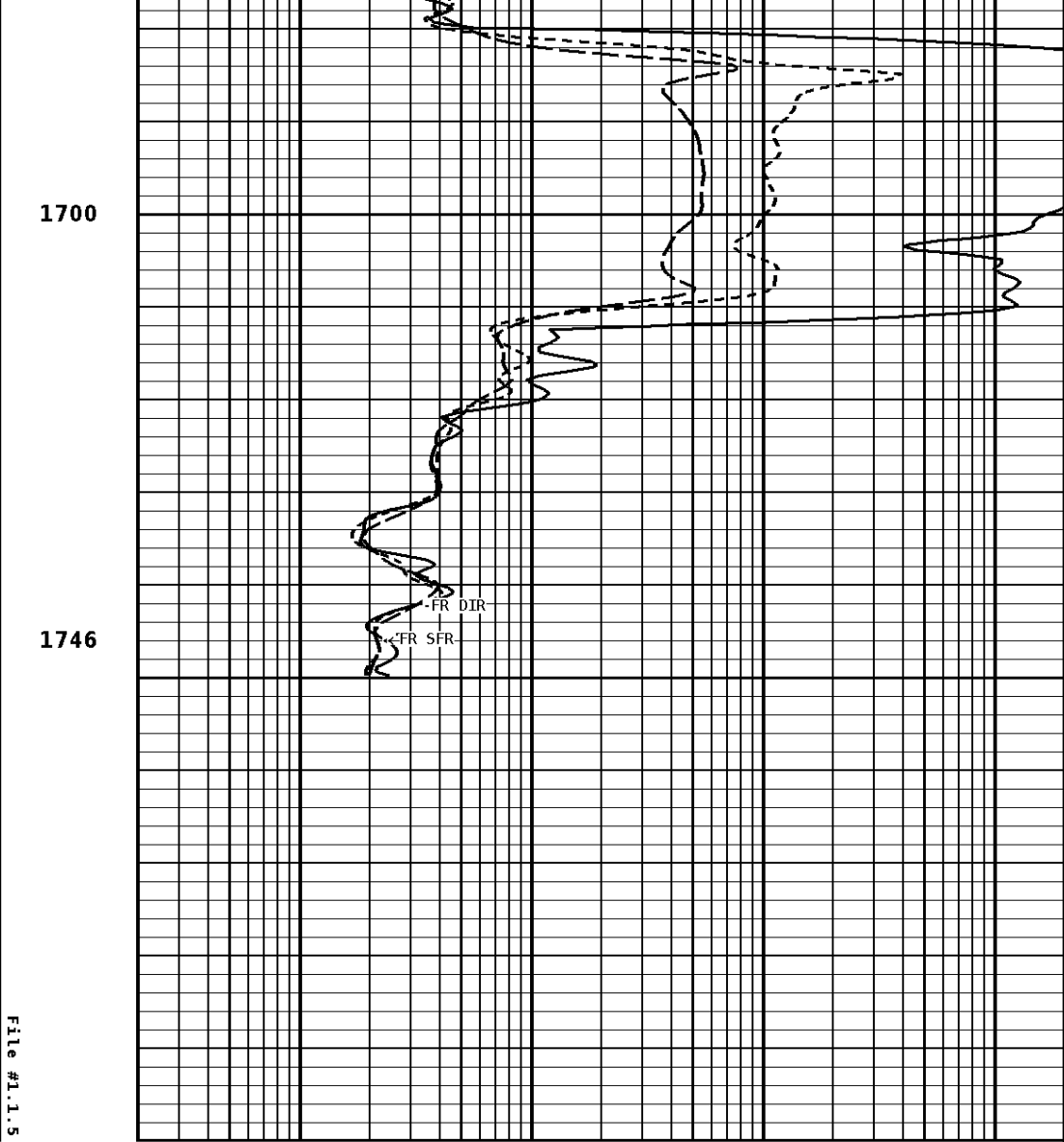
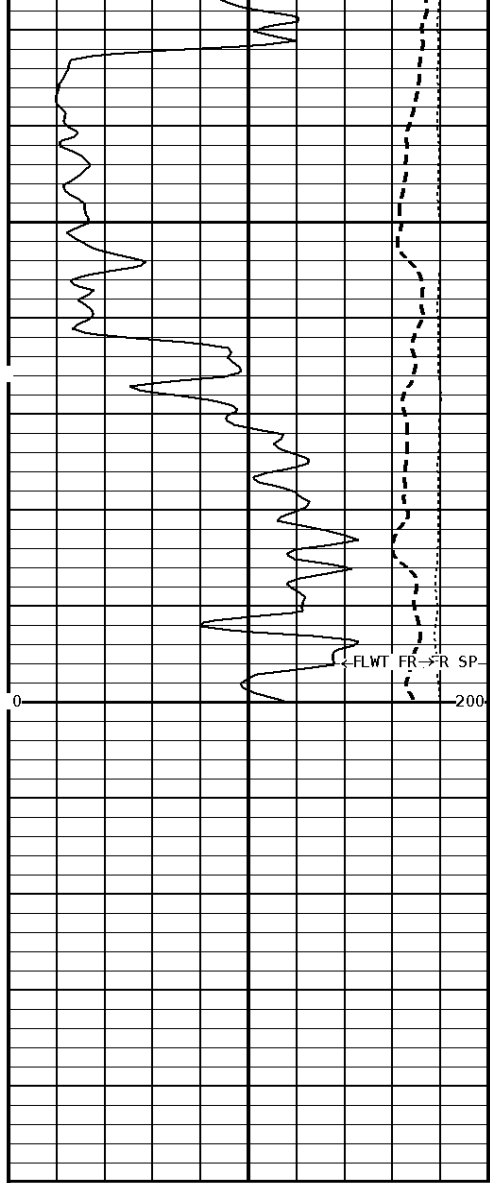


### 1:240 MAIN SECTION



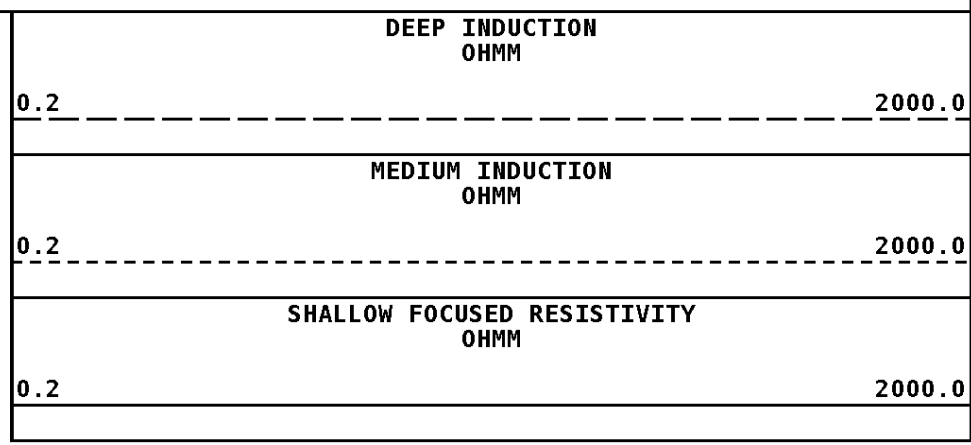
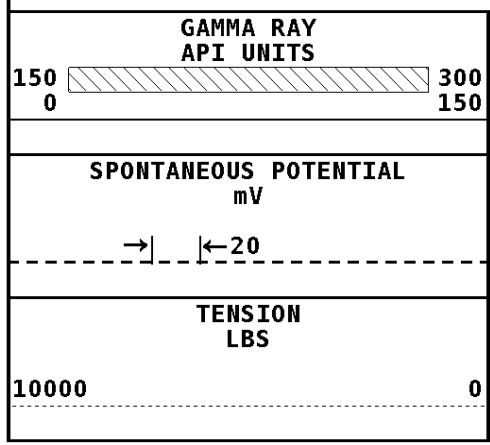
File #1.1.5





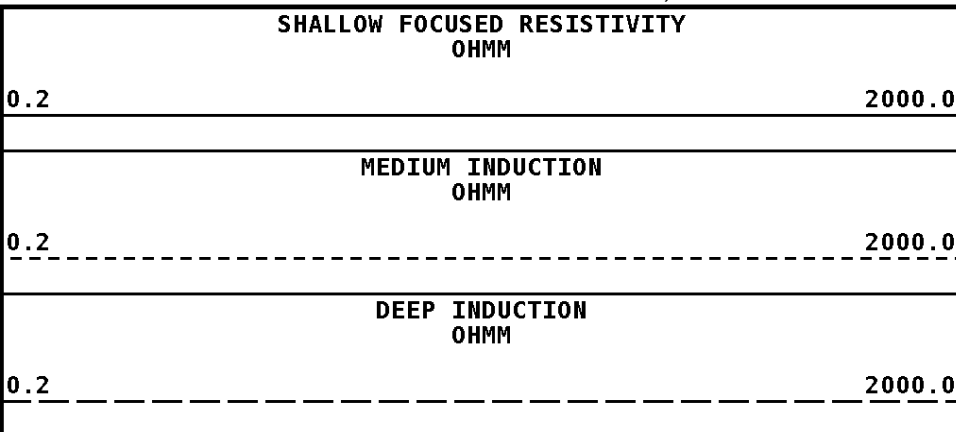
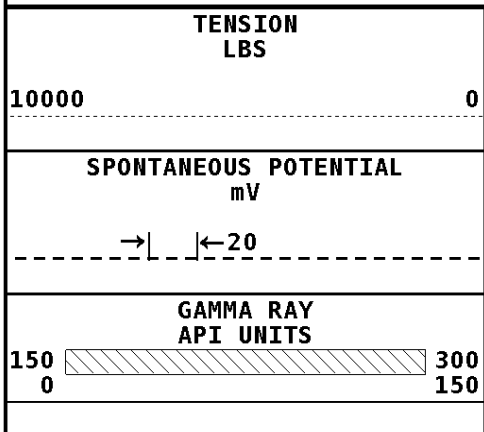
File #1.1.5

### 1:240 MAIN SECTION

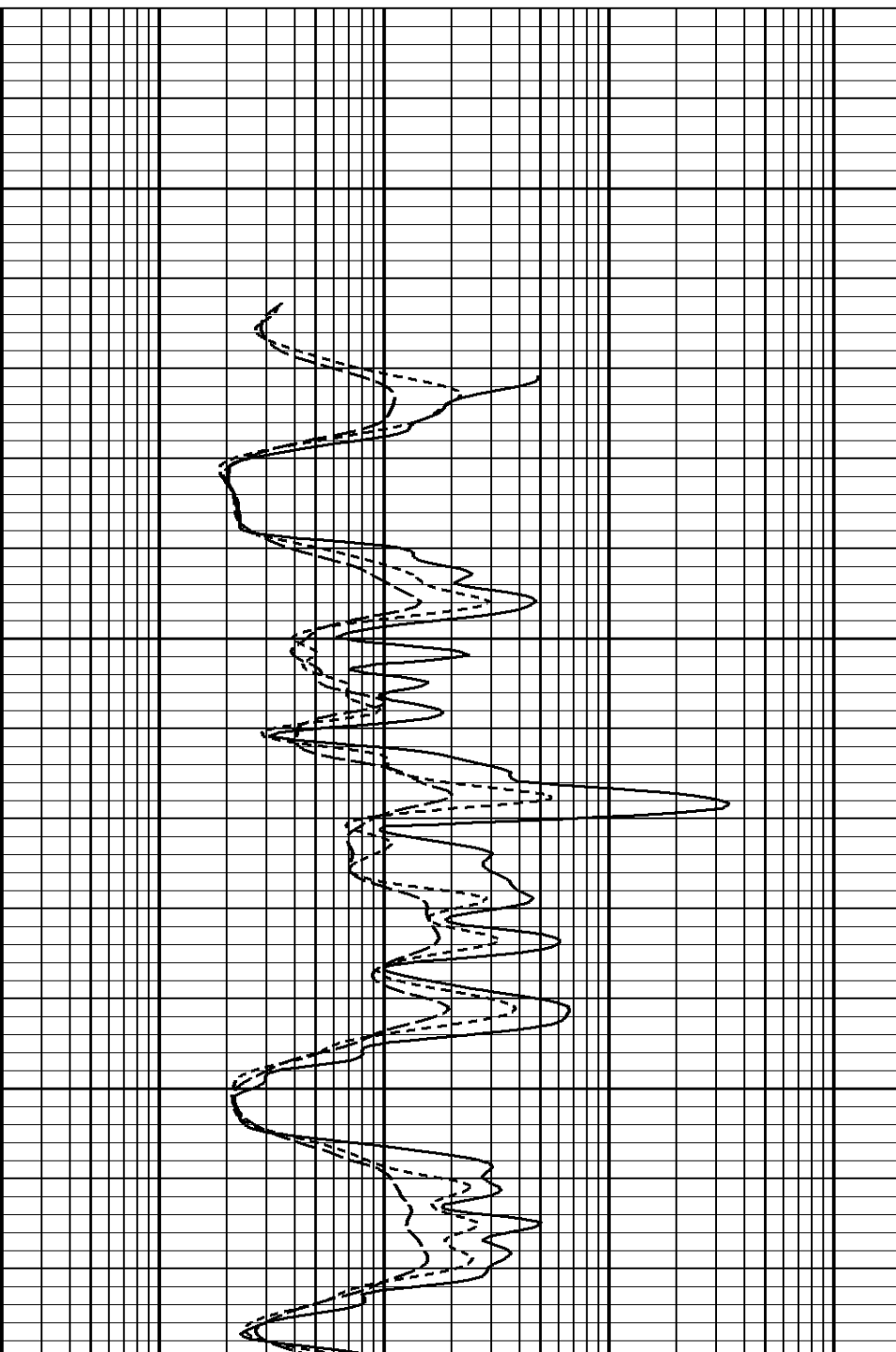
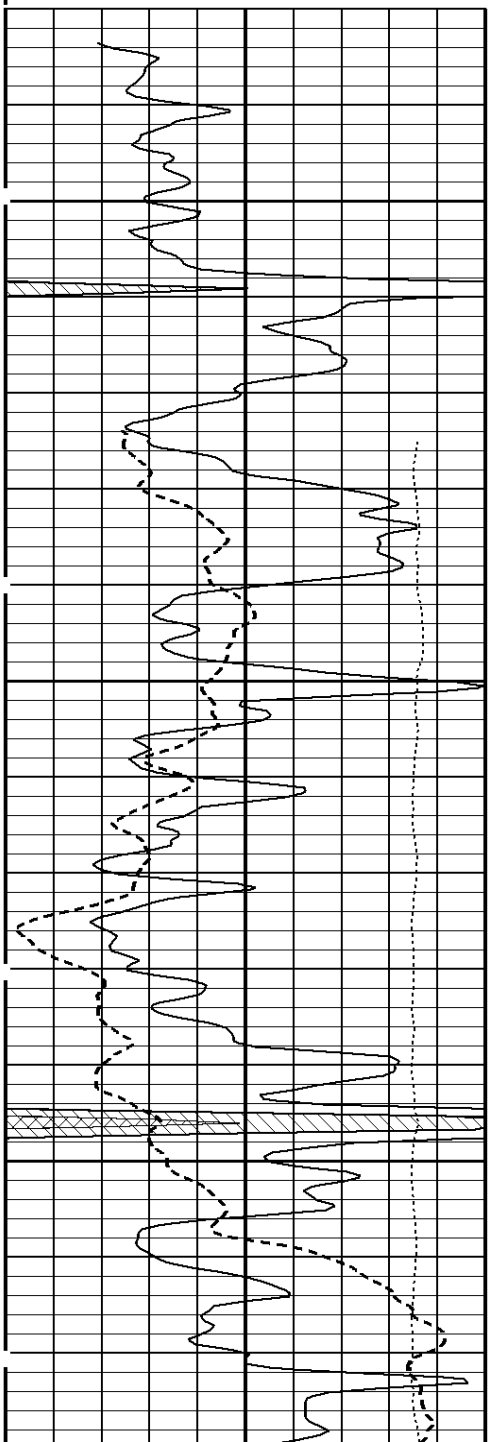


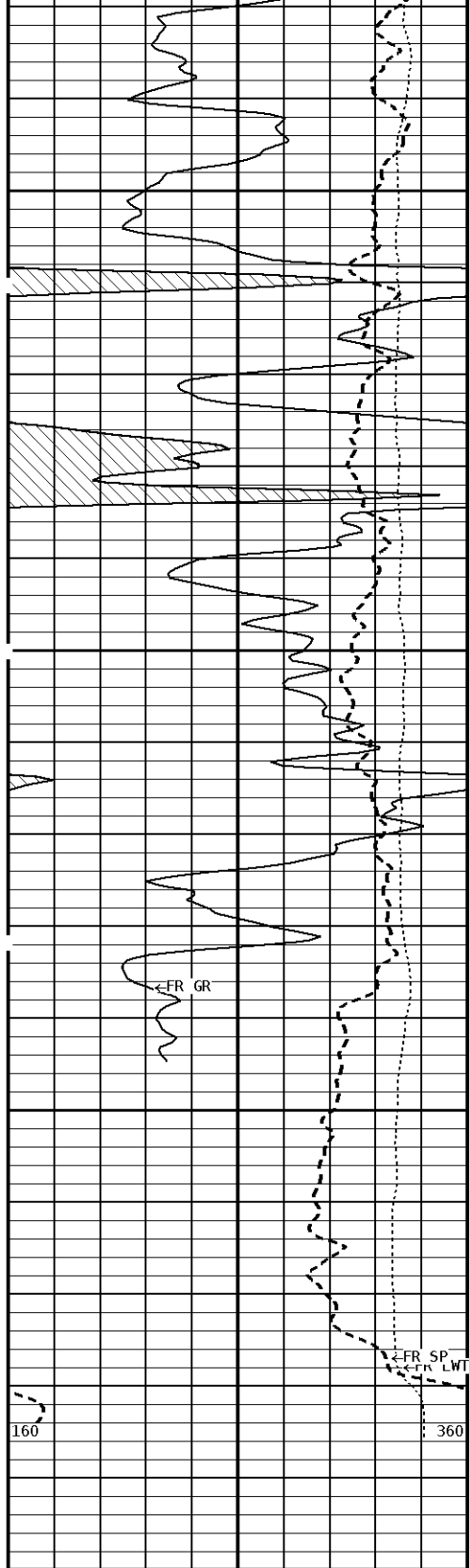
**\* Borehole Zone Factors \***

Zone 1	99999.0	to	0.0	Feet
Drill Bit Size			7.875	in
BHT Depth			3630.000	ft
Borehole Temperature			112.0	degF
Temperature Gradient			1.00	DFHF
Resistivity Of Mud			0.900	ohm/m
Resistivity Of Mud Temperature			65.00	degF



1:240 REPEAT SECTION

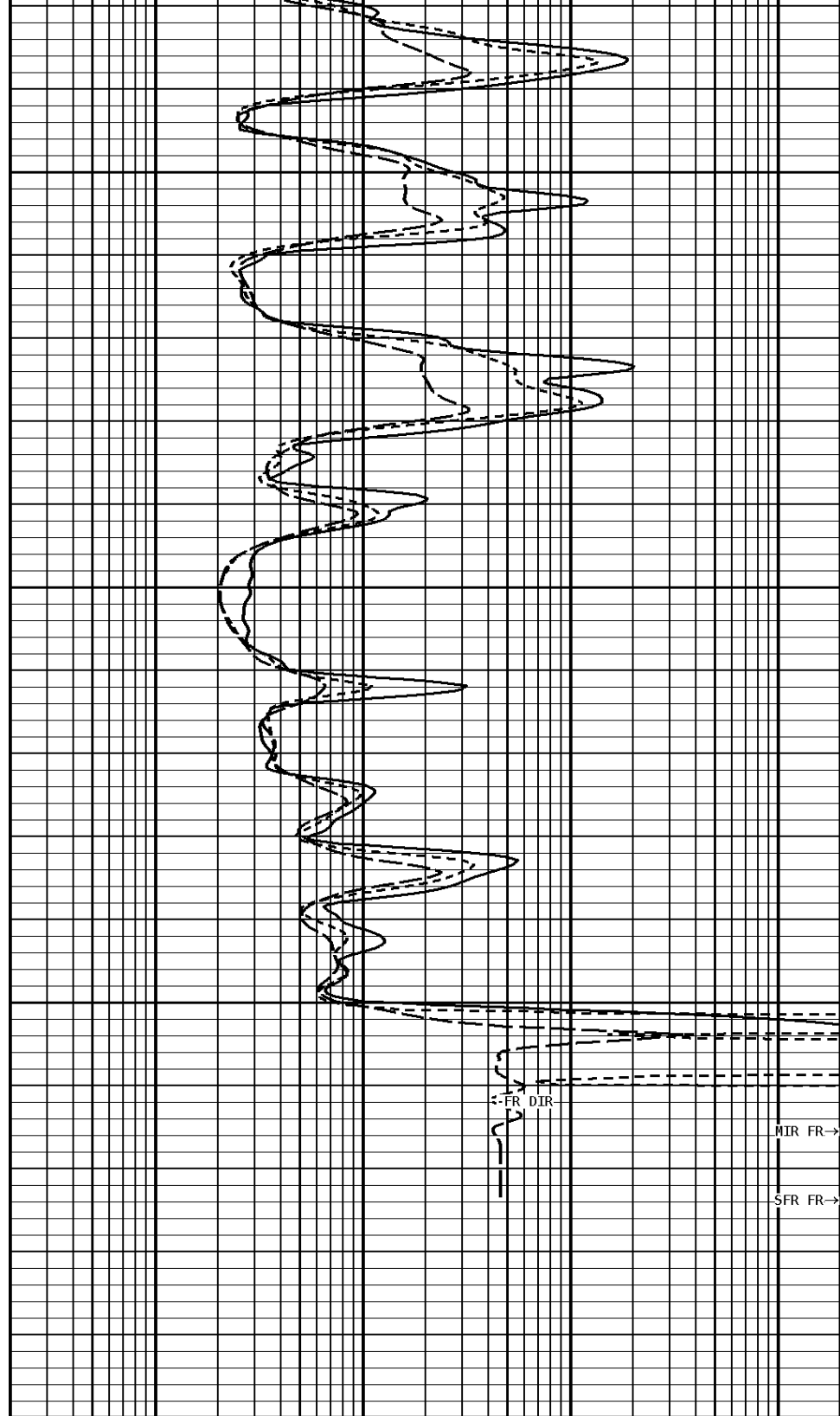




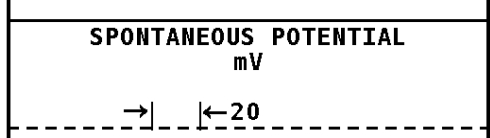
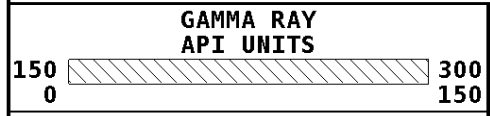
3500

3600

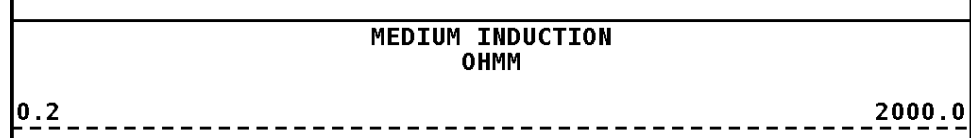
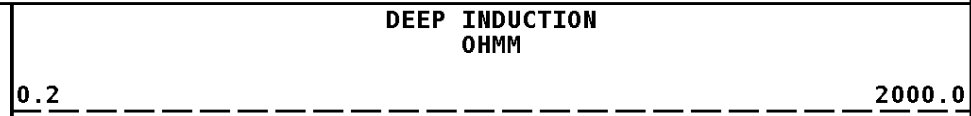
3629



1:240 REPEAT SECTION



TENSION



SHALLOW FOCUSED RESISTIVITY



LBS

OHMM

10000

0

0.2

2000.0

## \* Borehole Zone Factors \*

Zone 1 99999.0 to 0.0 Feet		
Drill Bit Size	_____	7.875 in
BHT Depth	_____	3630.000 ft
Borehole Temperature	_____	112.0 degF
Temperature Gradient	_____	1.00 DFHF
Resistivity Of Mud	_____	0.200 ohm/m
Resistivity Of Mud Temperature	_____	70.00 degF

## \* Calibration Summary \*

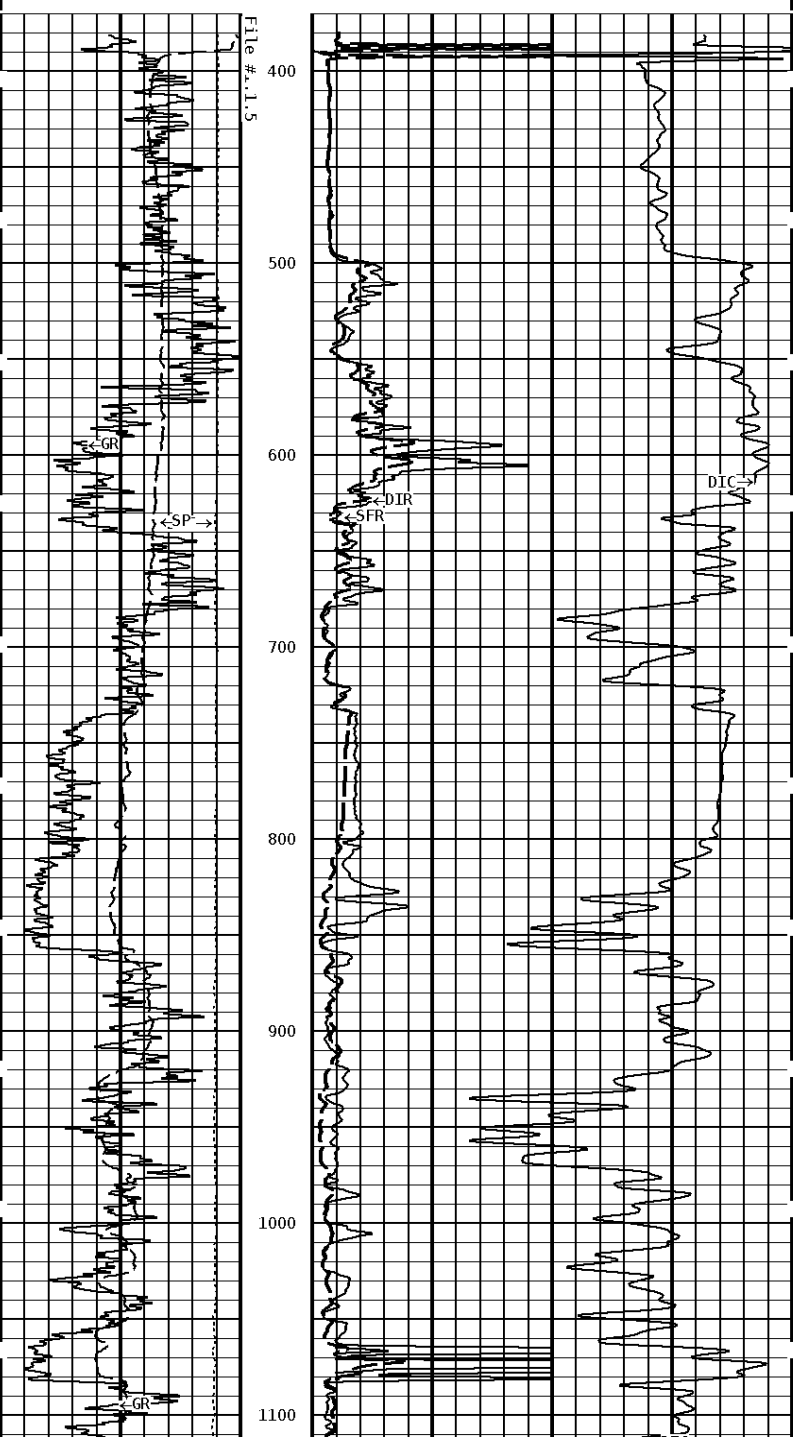
Shop Calibration						
GRT-B						
Performed : 16-MAY-2011			Time : 09:49			
Sensor Suite : GR-GR5			ID : GRT-BA-14			
	Measured	Units	Calibrated	Units		
GR	Background	Jig	Jig			
	50	361	175	GRAPI		
Shop Calibration						
PIT-CA						
Performed : 17-FEB-2012			Time : 10:55			
Sensor Suite : P-IND-T			ID : PIT-AC-22			
Medium						
	Measured		Calibrated		Units	
	R	X	R	X		
Air	129390	131208	-0.3	-0.3	MMHOS	
Zero	131066	131073	0.0	0.0	MMHOS	
Reference	248788	249307	5000.0	5000.0	MMHOS	
Loop	147423	174670	2603.6	1071.8	MMHOS	
Sonde Error			-2.9	-5.7	MMHOS	
Cond			5000.0	5000.0	MMHOS	
Deep						
	Measured		Calibrated		Units	
	R	X	R	X		
Air	129579	130441	-0.3	0.1	MMHOS	
Zero	131075	131074	0.0	0.0	MMHOS	
Reference	238600	238508	2000.0	2000.0	MMHOS	
Loop	148942	177007	1226.8	506.8	MMHOS	
Sonde Error			-0.7	-9.0	MMHOS	
Cond			2000.0	2000.0	MMHOS	
Temperature						
	Measured		Calibrated		Units	
	Low	High	Low	High		
	16980.0	56920.0	70.0	350.0	DEGF	
Performed : 17-FEB-2012			Time : 10:45			
Sensor Suite : SFL			ID : PIT-AC-22			
Internal						
	Measured		Calibrated		Units	
	Zero	Reference	Zero	Reference		
Im	32773.9	50555.3	0.0	7028.0	uA	
Ib	32767.2	50247.8	0.0	1750.0	mA	
MOM1	32800.4	60269.7	0.0	175.0	mV	
Equivalent SFL				43.97	OHMM	
Performed : 17-FEB-2012			Time : 10:38			
Sensor Suite : P-SP			ID : PIT-AC-22			
Internal						
	Measured		Calibrated		Units	
	Zero	Reference	Zero	Reference		
	32785.7	58911.1	0.0	1000.0	mV	
Performed : 17-FEB-2012			Time : 13:08			
Sensor Suite : P-RMUD			ID : PIT-AC-22			
Internal						
	Measured		Calibrated		Units	
	Zero	Reference	Zero	Reference		

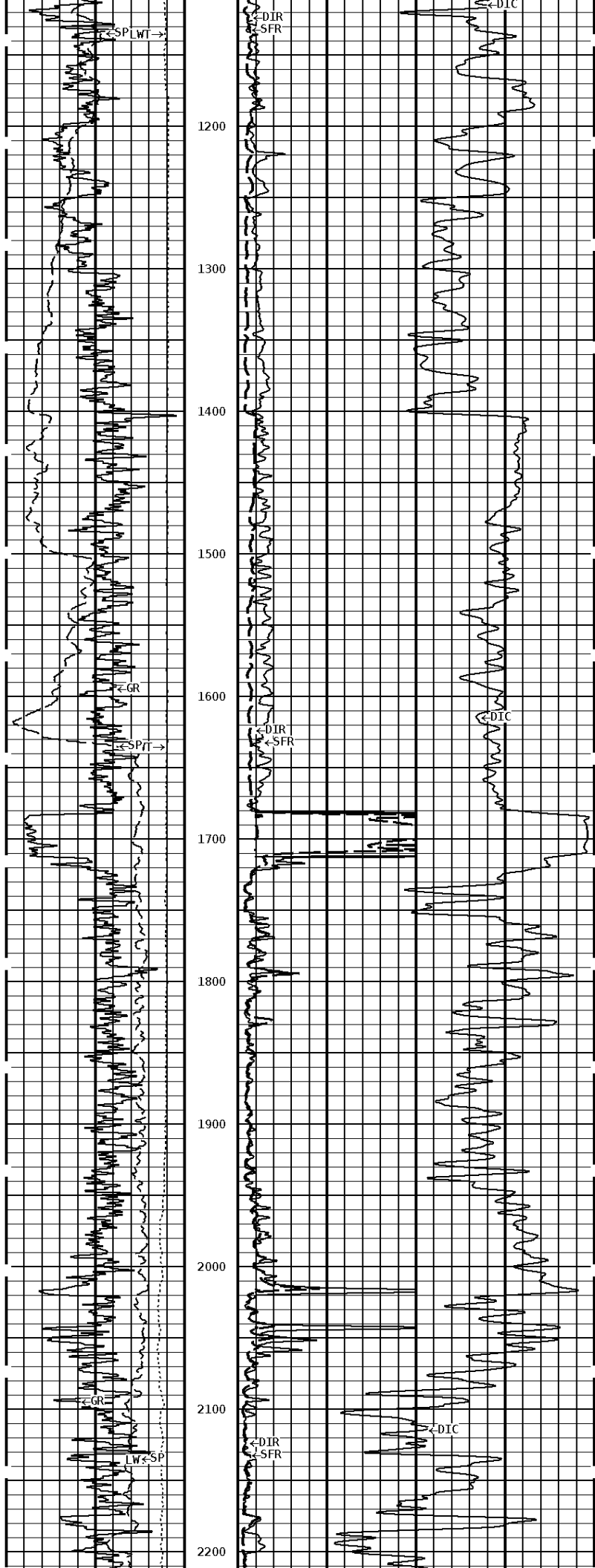
Rmi	5.0	Reference	54416.8	Zero	0.0	Reference	290.6	Units	mA
Rmv	4.7		54228.6	Zero	0.0		290.6		mV
Equivalent Rm							0.9037		OHMM

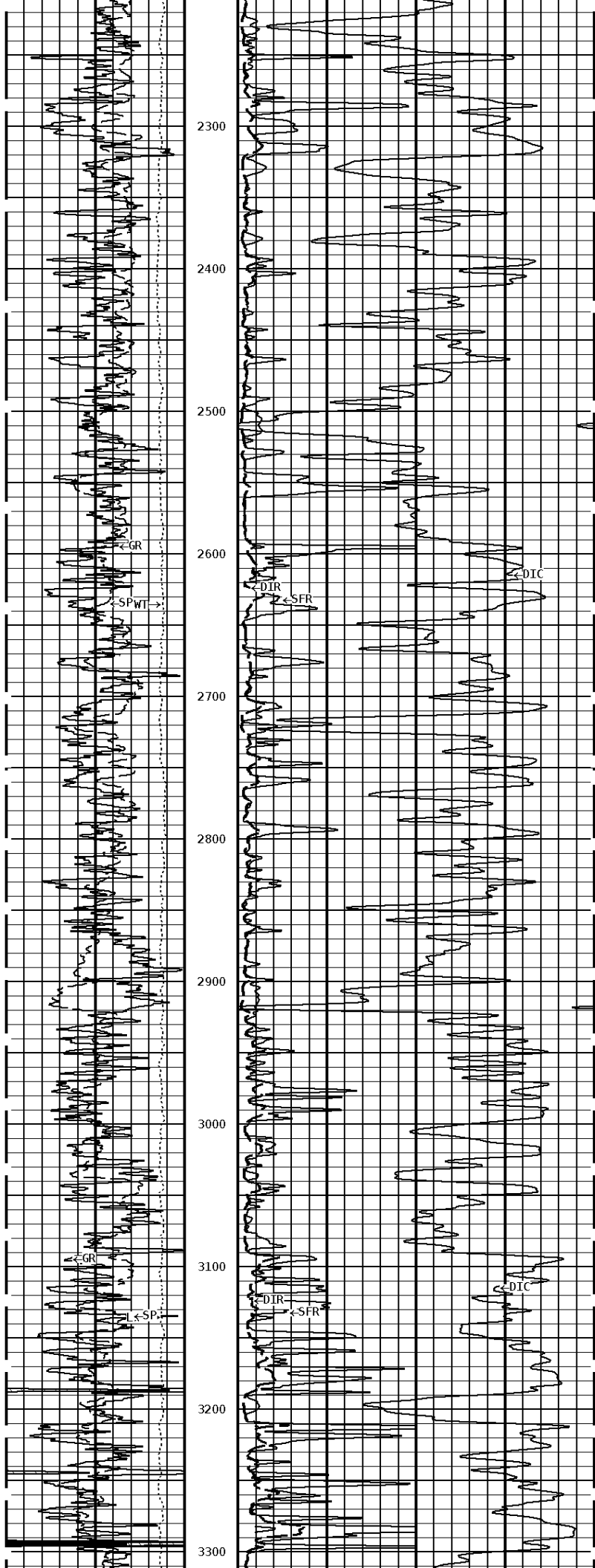
Well File: COBALT BROBST1-7 AUG7 STK      Scale: 1:1200  
 Segment: V1.D1.S5 FNL MN      Acquired: 2012-08/07 09:46 3.2.0-11172  
 Reference: 0      Processed: 2012-08/07 10:49 3.2.0-11172

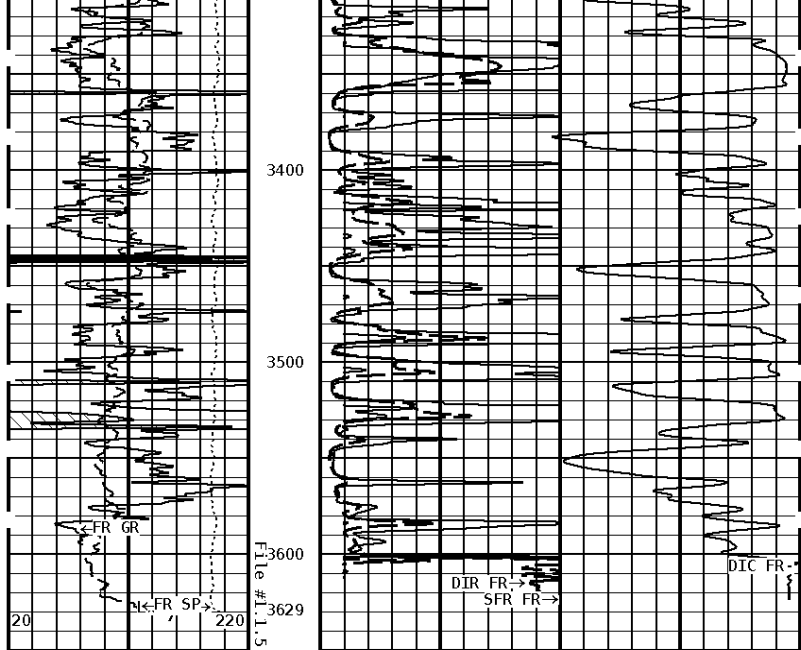
TENSION LBS	DEEP INDUCTION OHMM
10000 ----- 0	0.0 ----- 500.0 0.0 ----- 50.0
SPONTANEOUS POTENTIAL mV	SHALLOW FOCUSED OHMM
→   ← 20	0.0 ----- 500.0 0.0 ----- 50.0
GAMMA RAY API UNITS	DEEP CONDUCTIVITY MHMO
150  300 0 ----- 150	2000 ----- 1000 1000 ----- 0

1:1200 MAIN SECTION









**1:1200 MAIN SECTION**

<b>GAMMA RAY API UNITS</b>	
150	300
0	150
<b>SPONTANEOUS POTENTIAL mV</b>	
→	← 20
<b>TENSION LBS</b>	
10000	0

<b>DEEP CONDUCTIVITY MHMO</b>	
2000	1000
1000	0
<b>SHALLOW FOCUSED OHMM</b>	
0.0	500.0
0.0	50.0
<b>DEEP INDUCTION OHMM</b>	
0.0	500.0
0.0	50.0



**Tucker**  
**ENERGY SERVICES**

Company: COBALT ENERGY LLC  
 Well: BROBST "A" #1-7  
 Location: 660' FSL 660' FEL  
 Logged: 2012-08-07  
 K.B. Elev: 2117.0