RELIANCE OILFIELD SERVICES

Radial Cement Bond Gamma Ray Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal RU 424-17
Field	Rulison
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC
Well Federal RU 424-17
Field Rulison
County Garfield State Colorado
Location: API # : 05-045-23742
SEC 17 TWP 7S RGE 93W

Other Services
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			Elevation
Permanent Datum	Ground Level	Elevation 8365.6'	K.B. 8389.6'
Log Measured From	Kelly Bushing	24 FT	D.F. 8388.6'
Drilling Measured From	Kelly Bushing		G.L. 8365.6'

Date	06-JUN-2018
Run Number	One
Depth Driller	10491 FT
Depth Logger	10397 FT
Bottom Logged Interval	10384 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Fresh Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	244°F
Estimated Cement Top	See Log
Time Well Ready	ROA
Time Logger on Bottom	5:45
Equipment Number	HD-0359
Location	Grand Junction, CO
Recorded By	Z Fisher
Witnessed By	D. Welsh

Borehole Record				Tubing Record		
Run Number	Bit	From	To	Size	Weight	From	To

Casing Record	Size (in)	Wgt (lbs/Ft)	Grade	Top	Bottom
Surface Casing	9 5/8	32.3	H-40	Surface	1105 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	10450 FT
Intermediate #2					
Liner					

<<< Fold Here >>>

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

Comments

Log ran as per customer request
Depth referenced to Kelly Bushing at 24 FT
Marker Joint Logged from 6369 FT - 6390 FT
Log ran from 10384 FT to Surface
Log ran with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!!

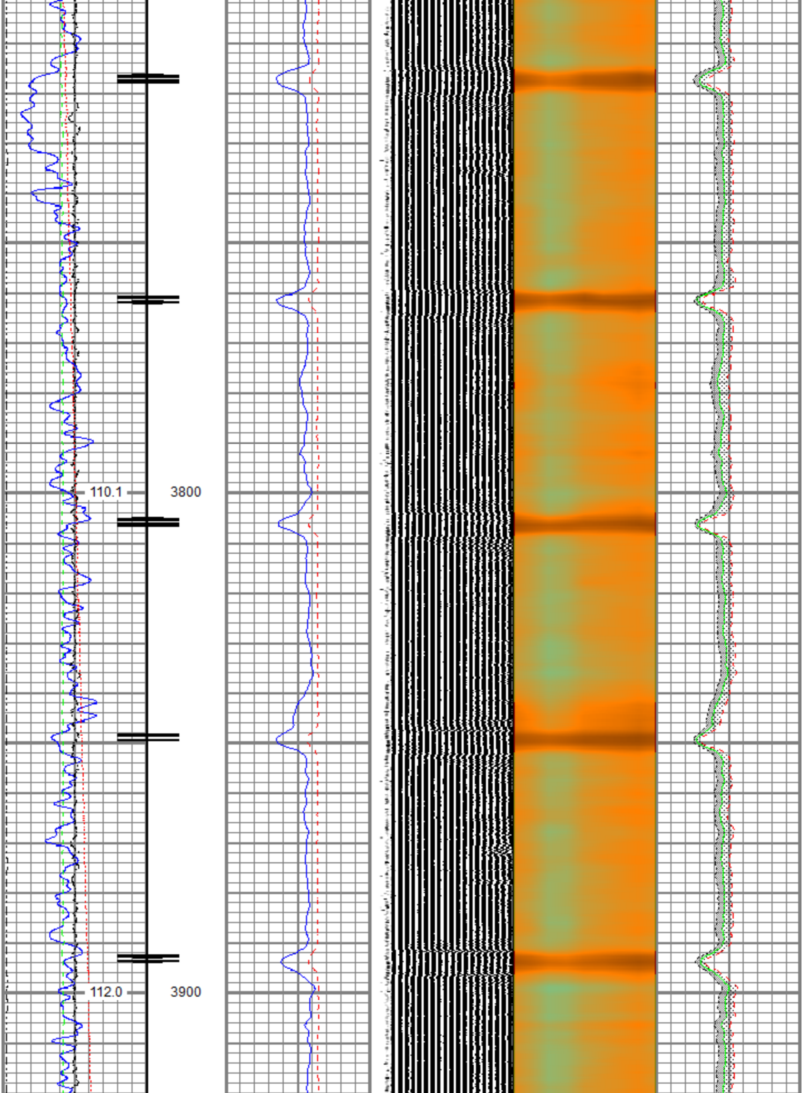
RELIANCE OILFIELD SERVICES

Main Pass

Recorded With 0 PSI Surface Induced Pressure

Database File	tep_federal ru 424-17_rbl_06-06-18\tep_federal ru 424-17_rbl_06-06-18.db
Dataset Pathname	mains1.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Wed Jun 06 15:31:00 2018
Charted by	Depth in Feet scaled 1:240

Curve	Left	Unit	Right
Gamma Ray	0	(GAPI)	200
Line Speed	-150	(ft/min)	150
Line Tension	0	(lb)	2000
Differential Temperature	-2	(degF)	2
Temperature	0	(degF)	20
CCL	10		0
3' Amplitude	0	(mV)	100
3' Amplitude x 5	0	(mV)	20
3' Travel Time	300	(usec)	200
5' Variable Density Log	200		1200
Sector Map	10		110
Average Amplitude	0		150
MimimumAmplitude	0		150
MaximumAmplitude	0		150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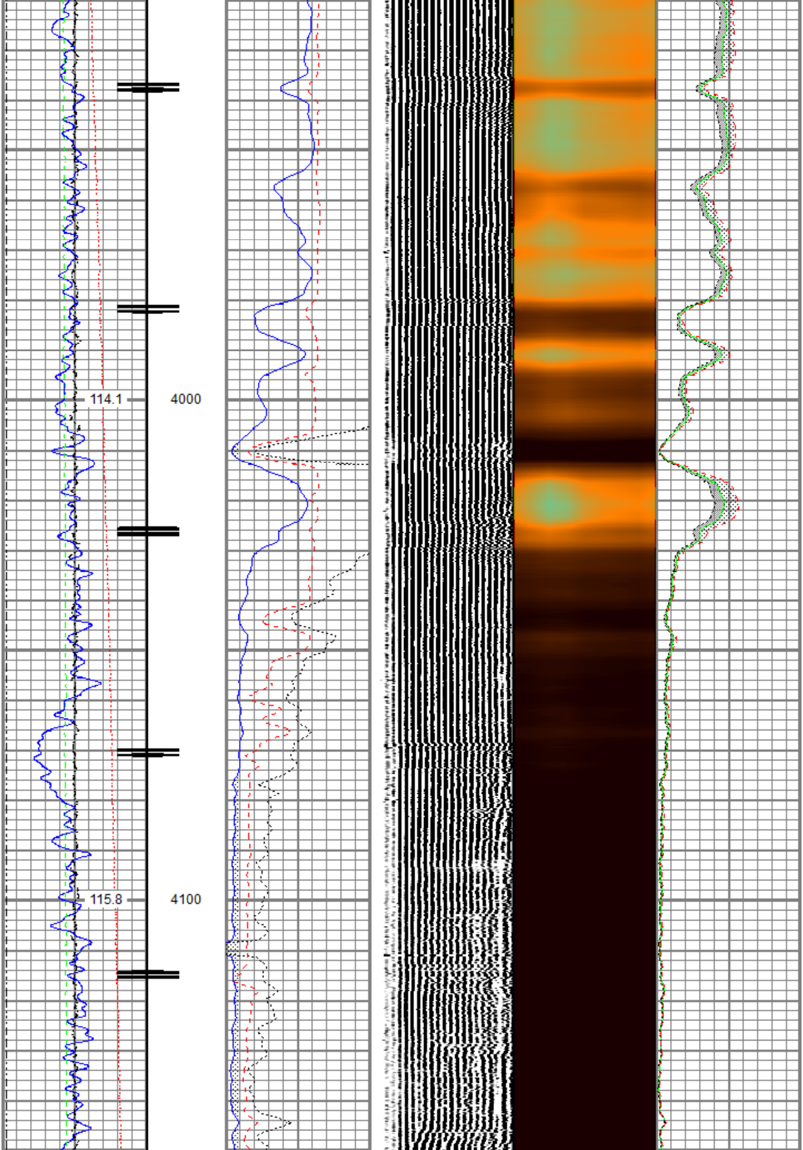
3800
112.0
3900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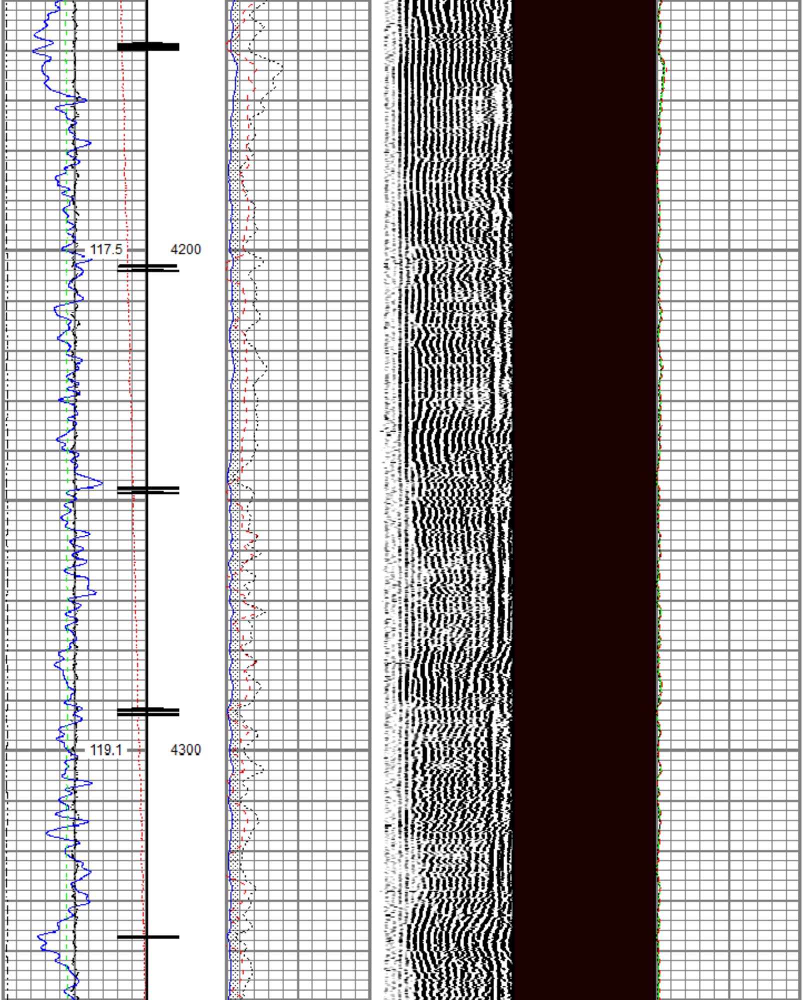
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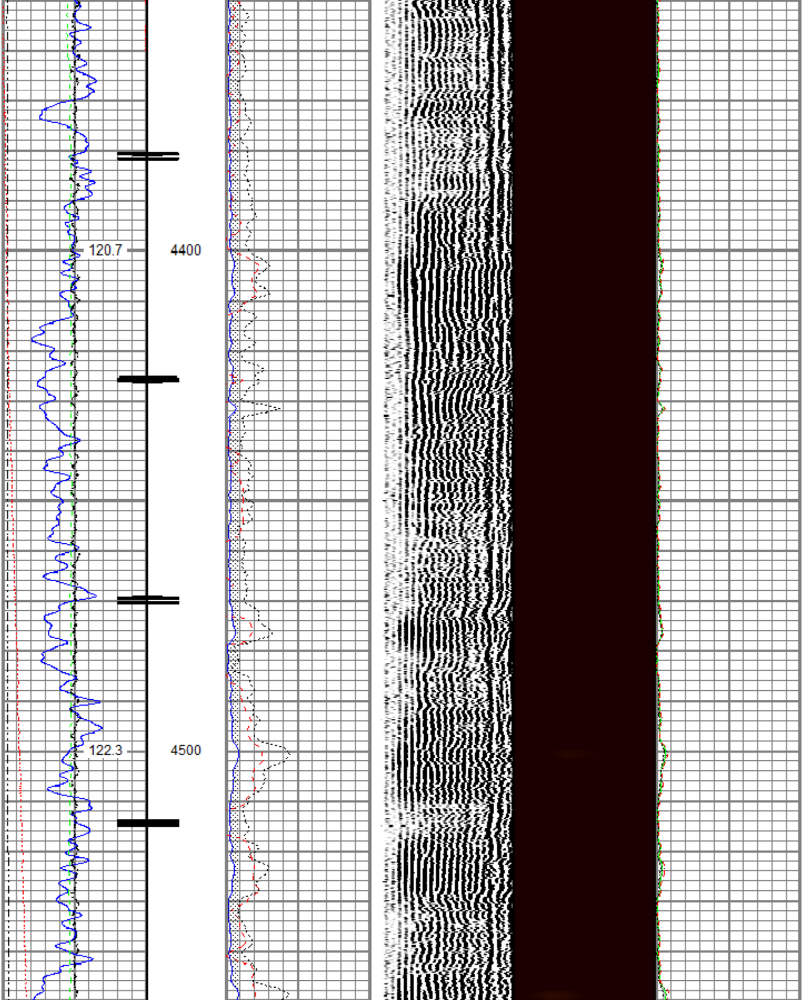
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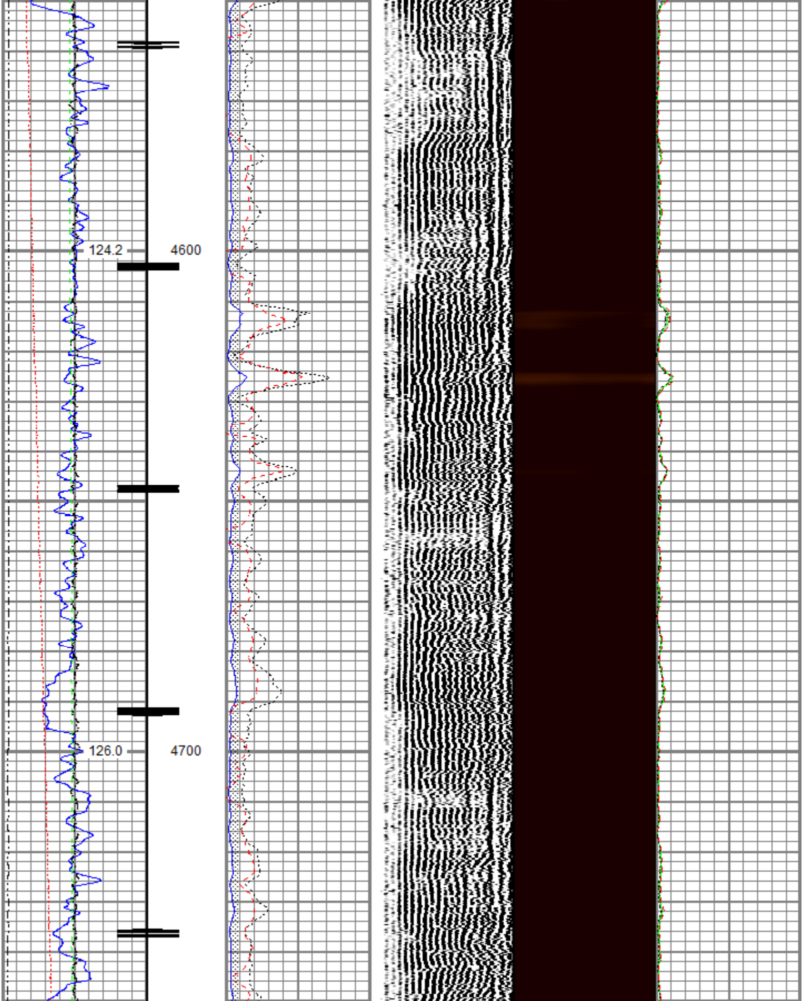
4400
122.3
4500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4600
126.0
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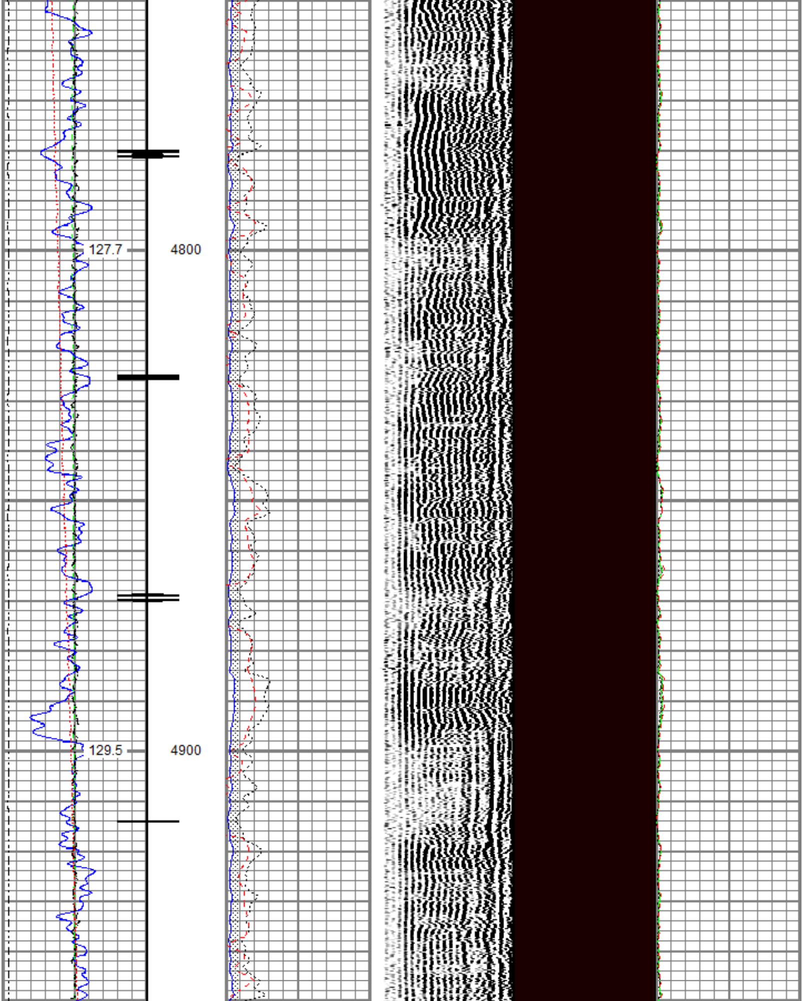
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4800
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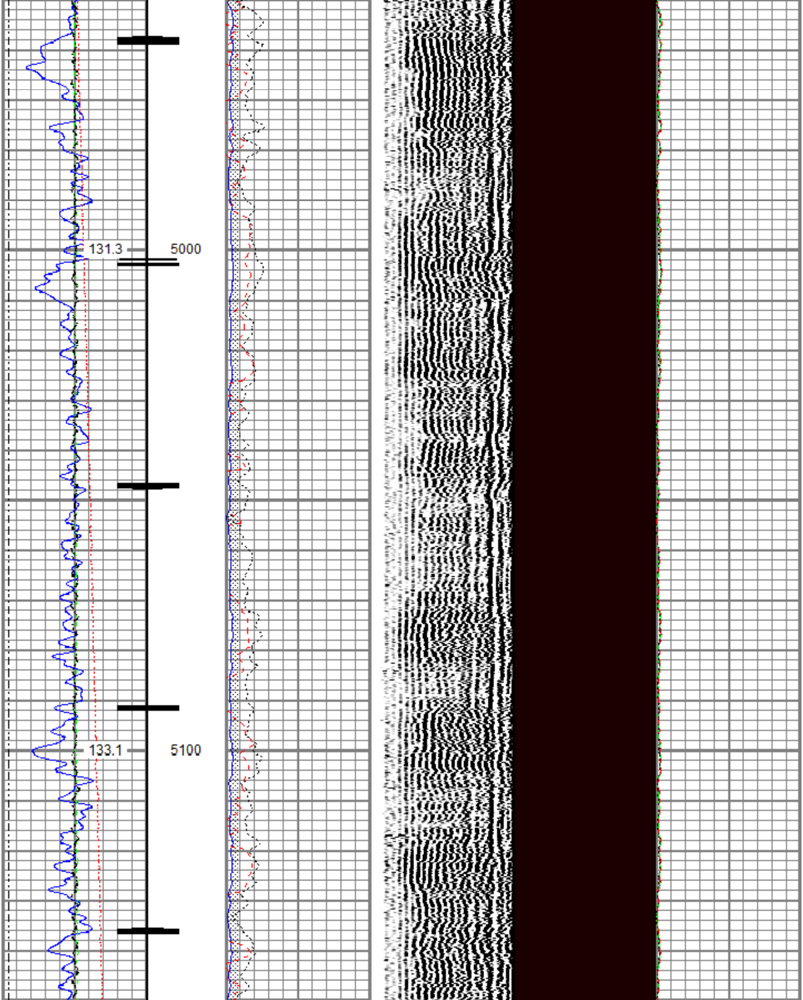
4900



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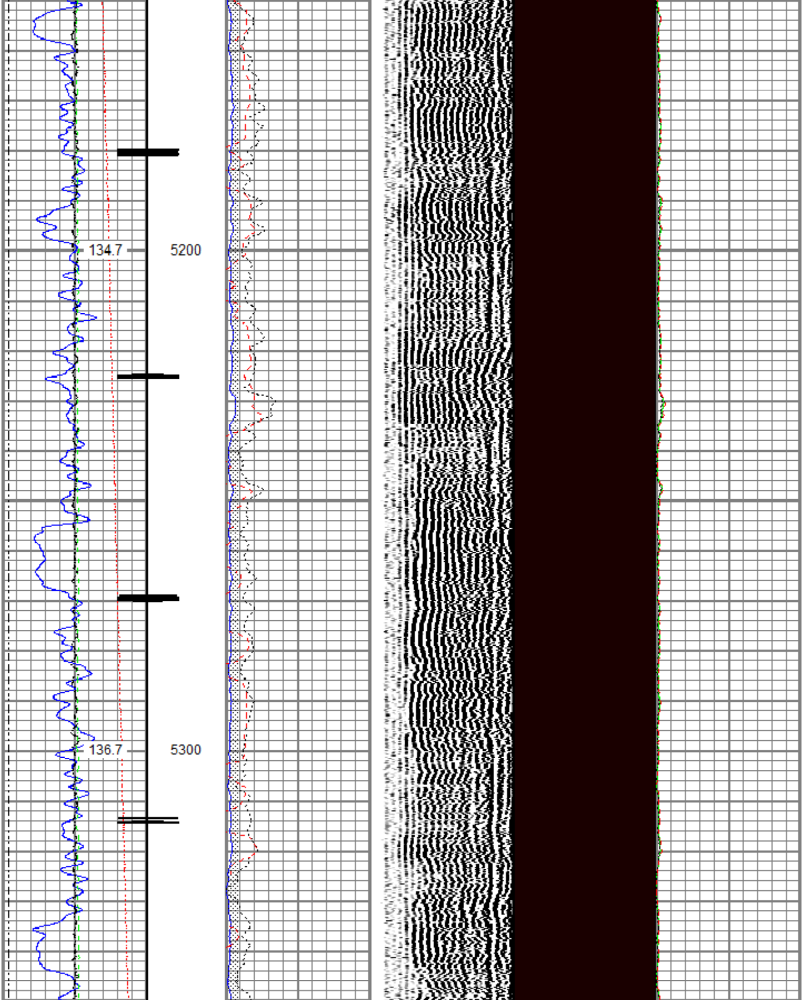
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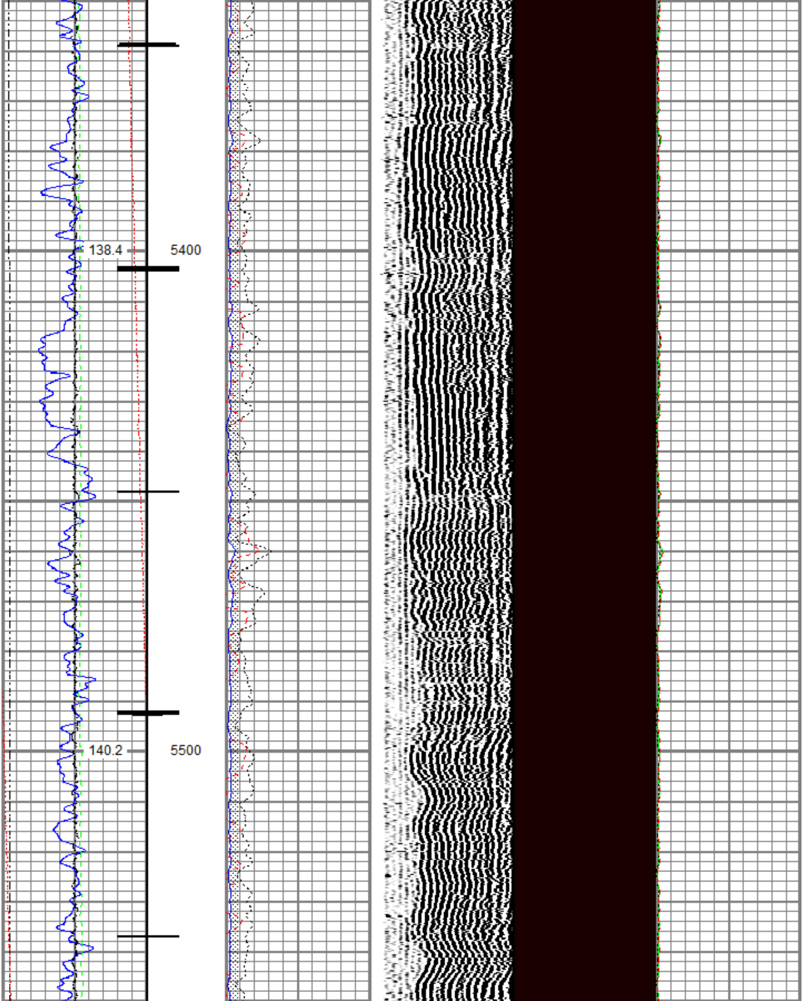
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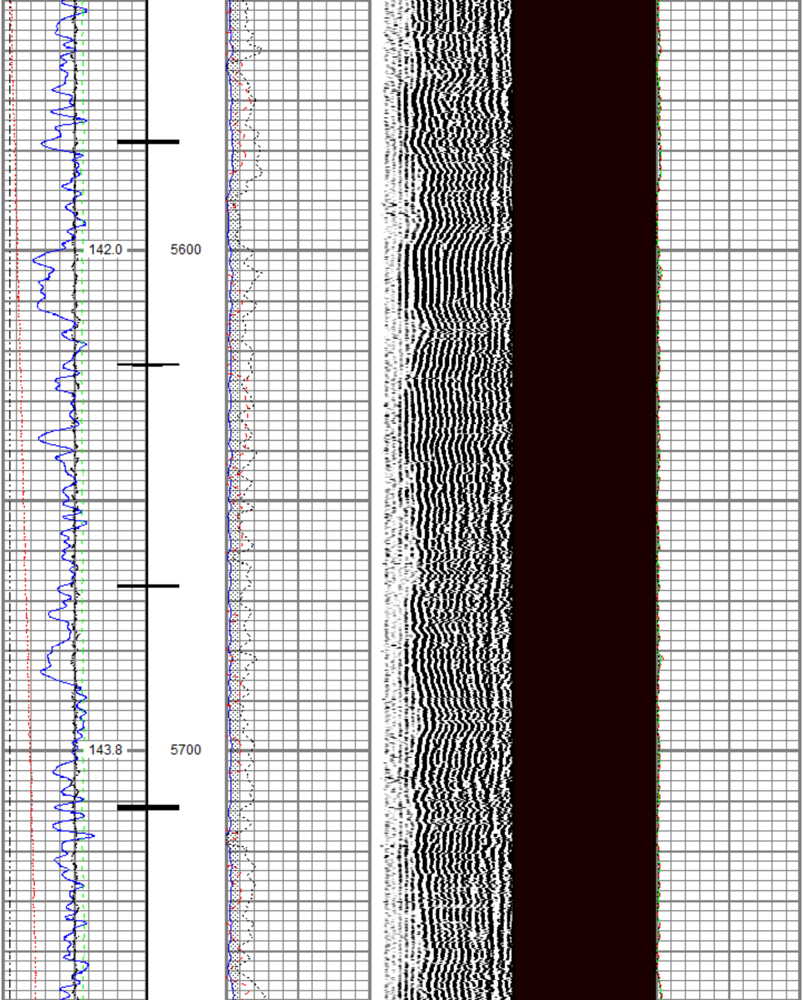
140.2
5500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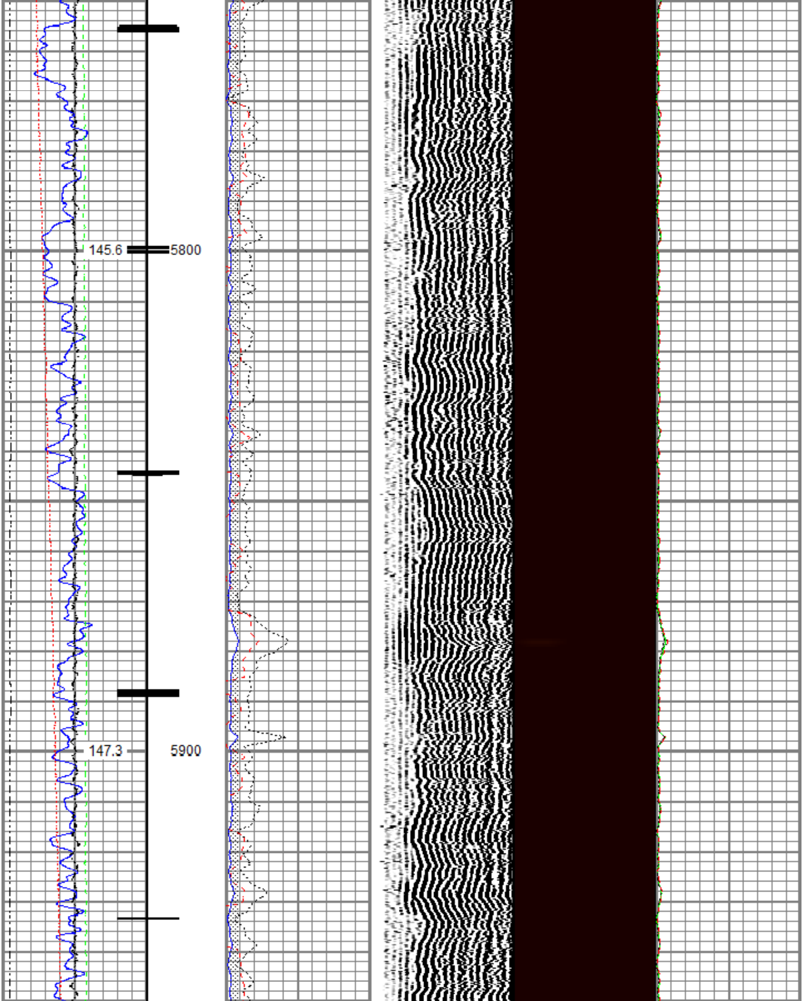
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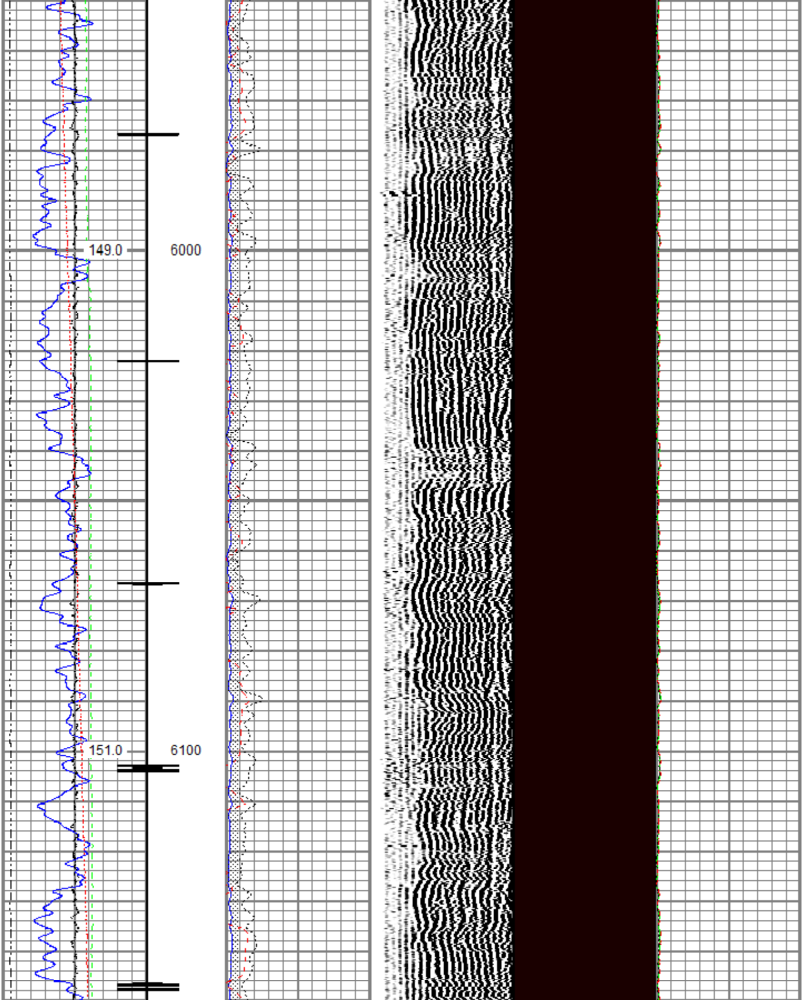
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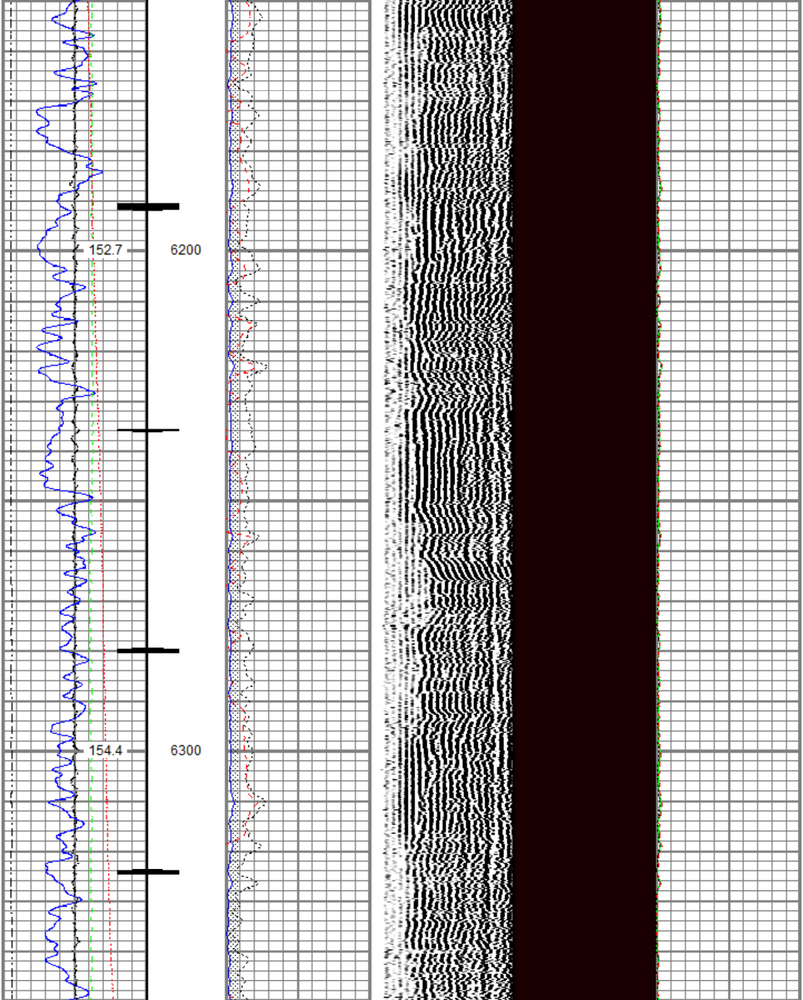
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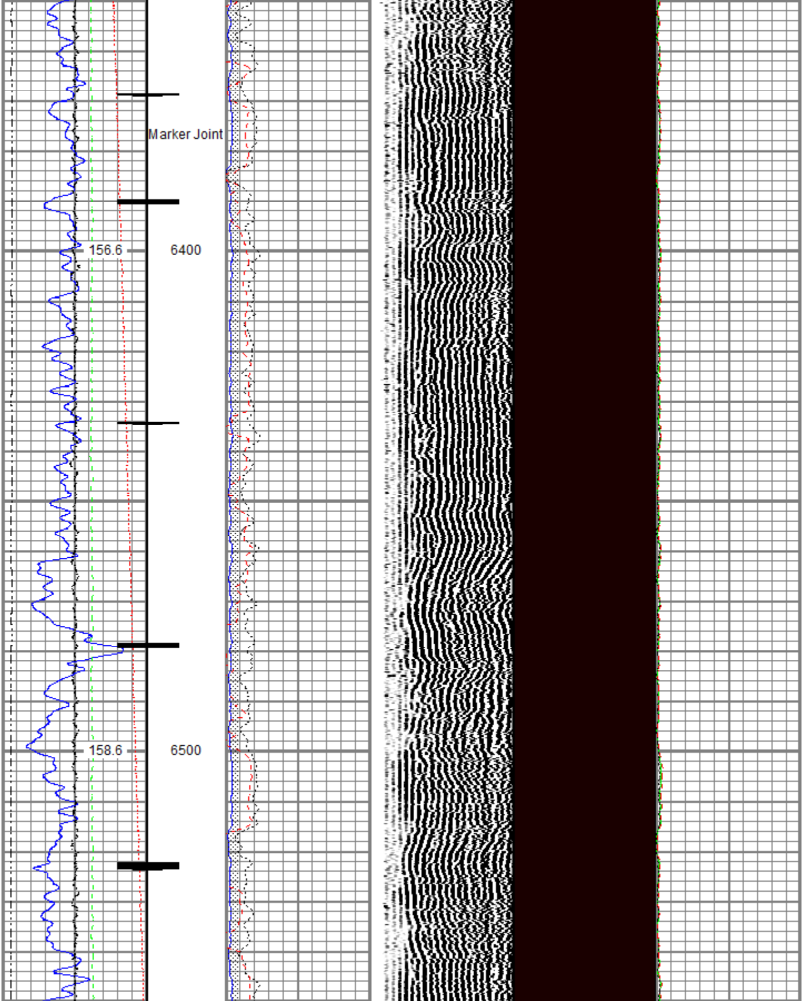
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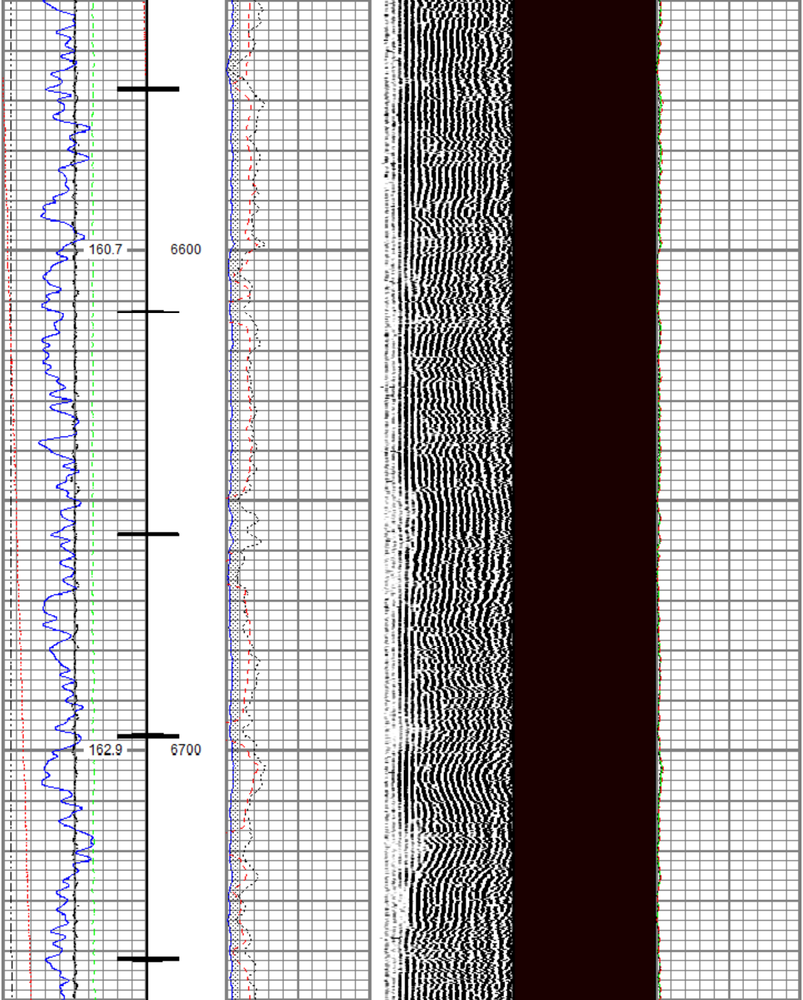
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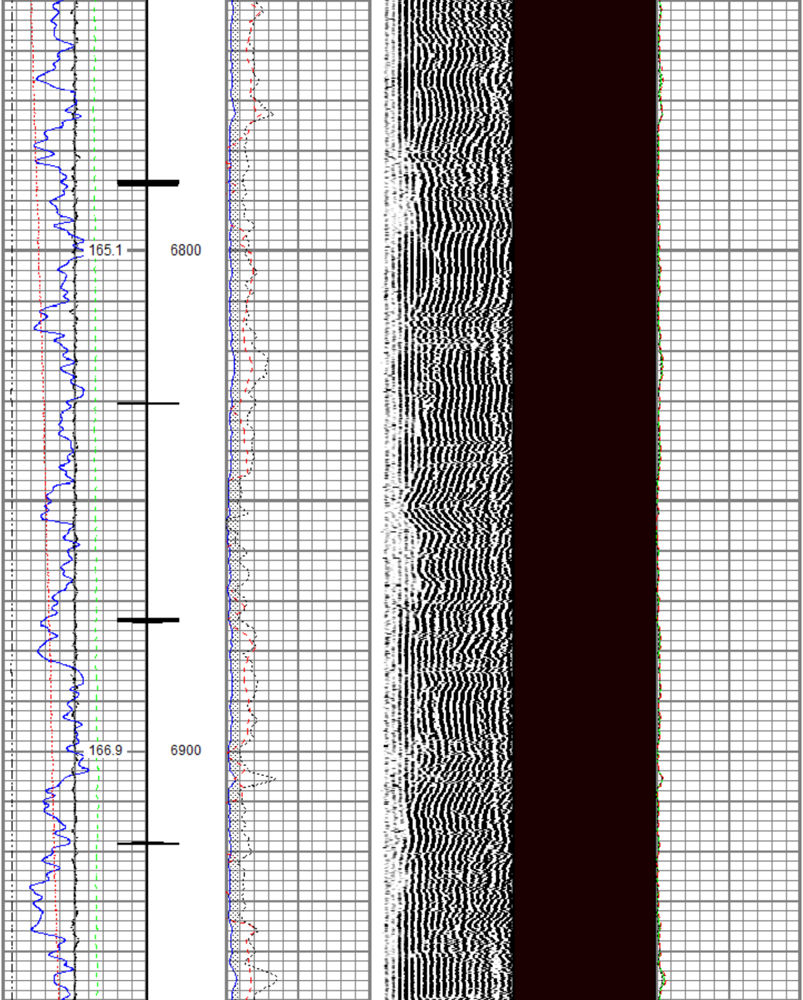
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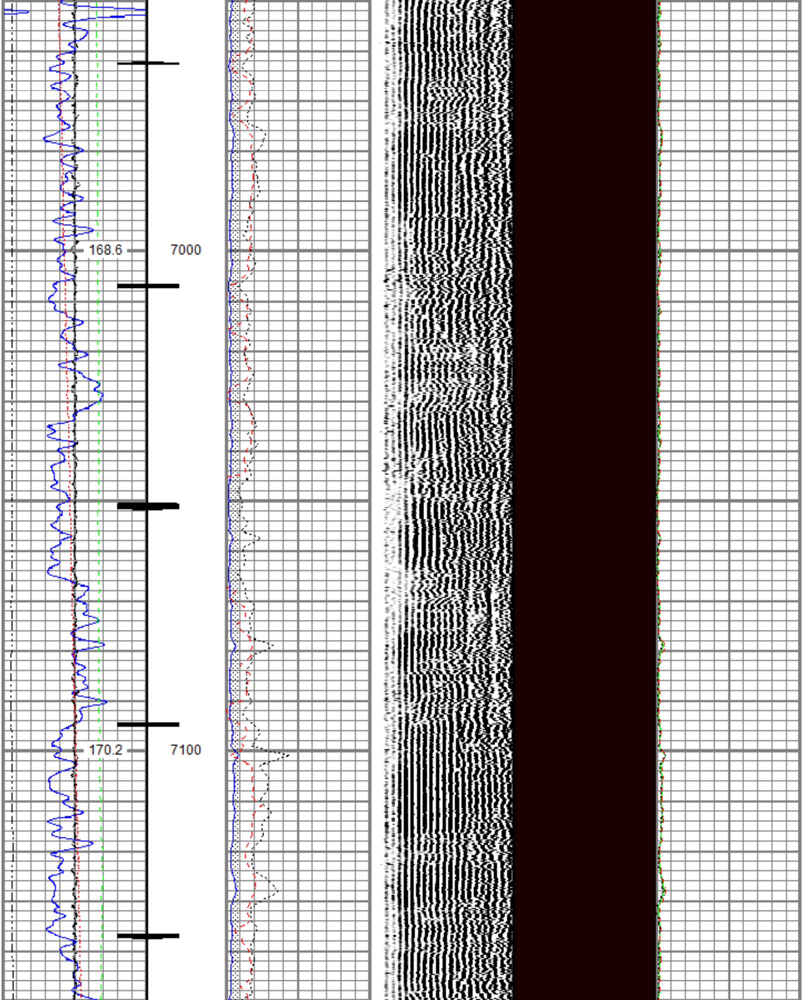
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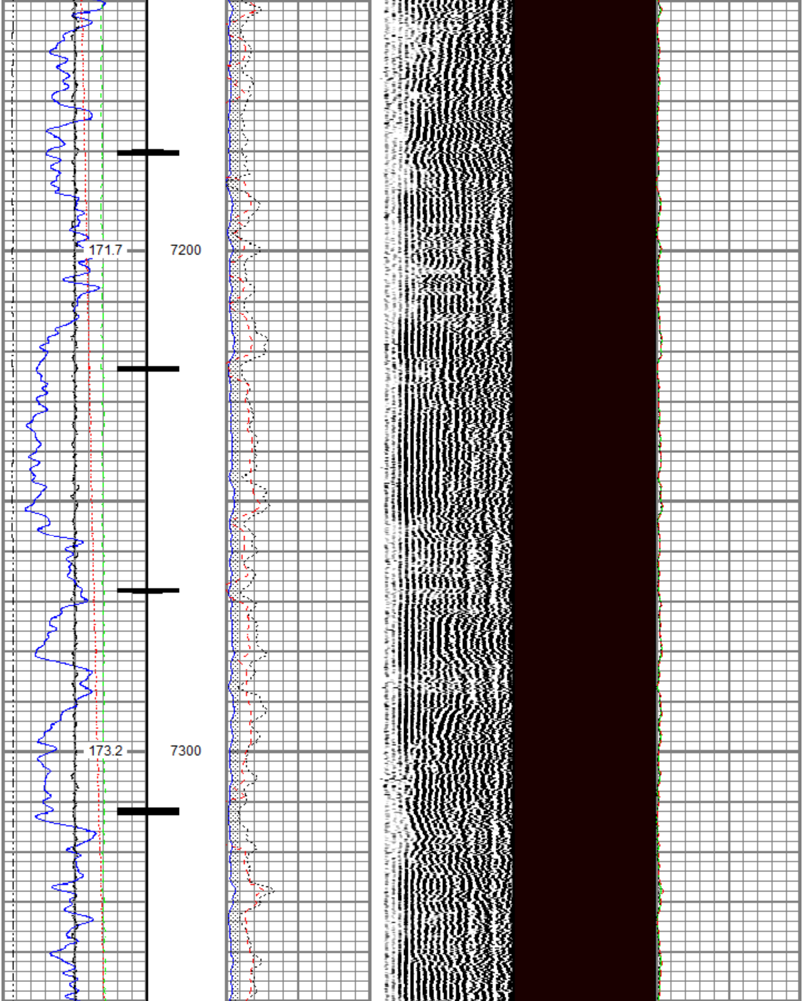
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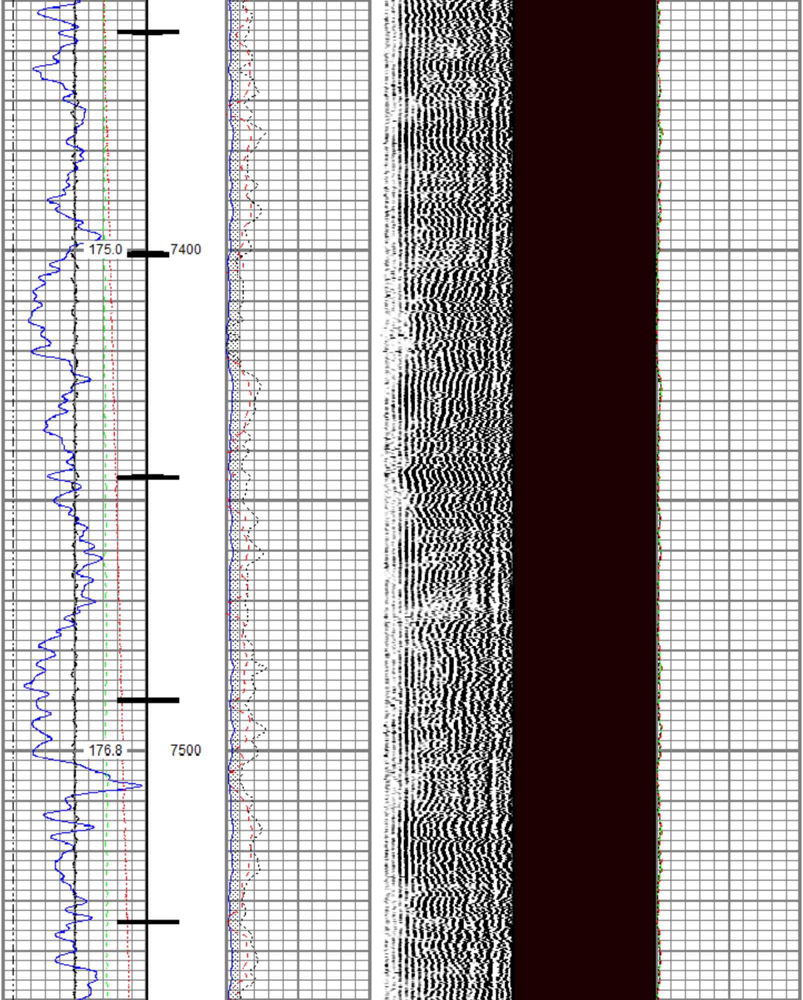
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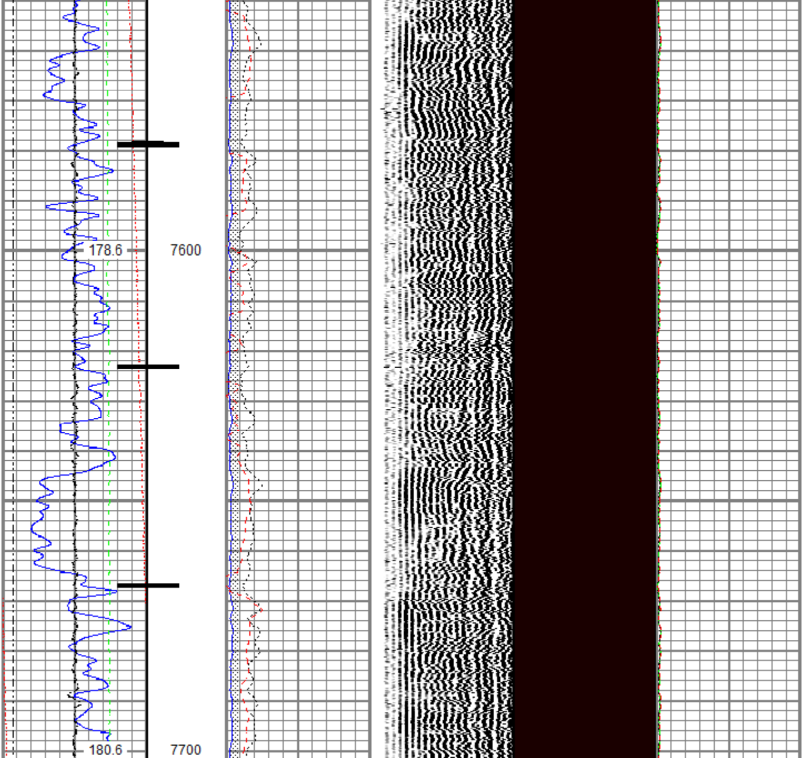

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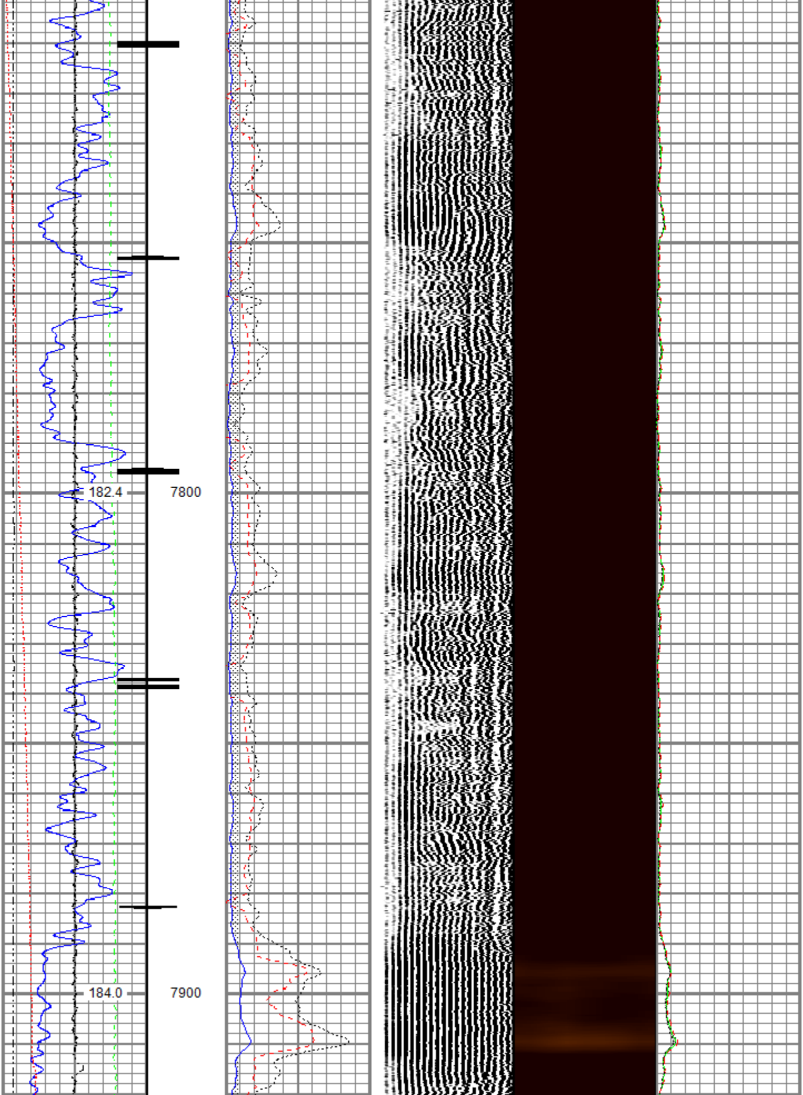
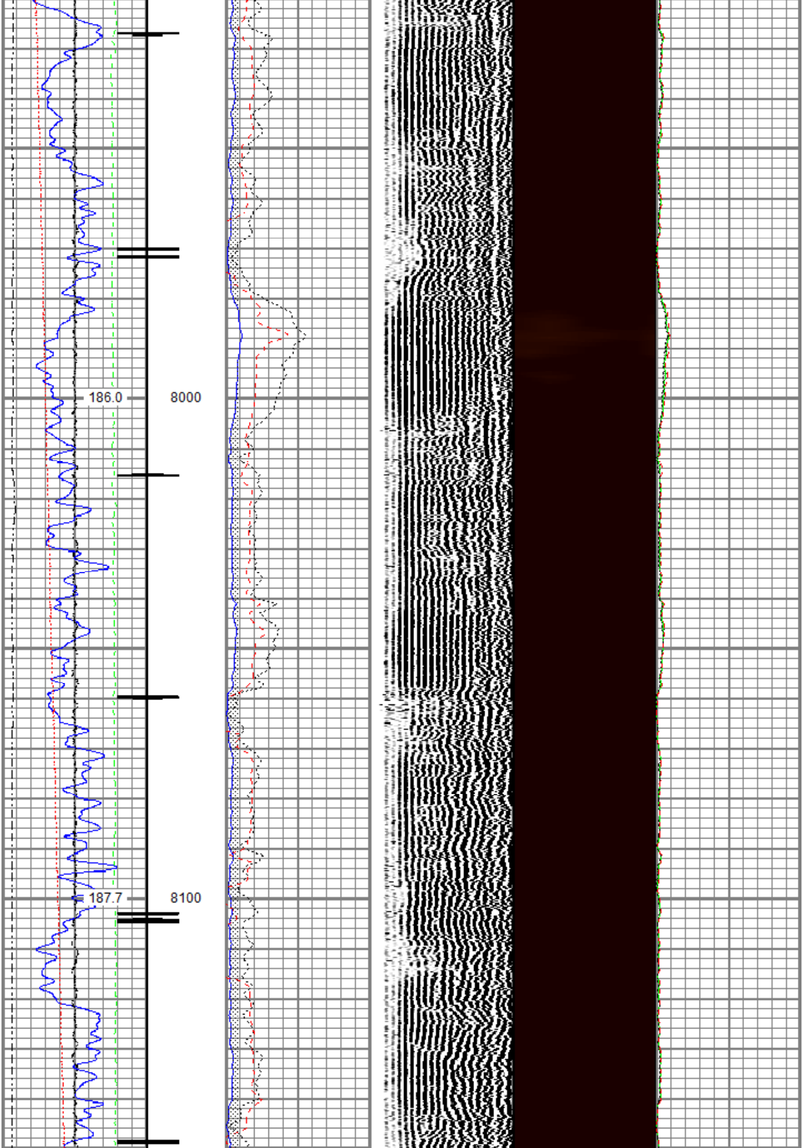
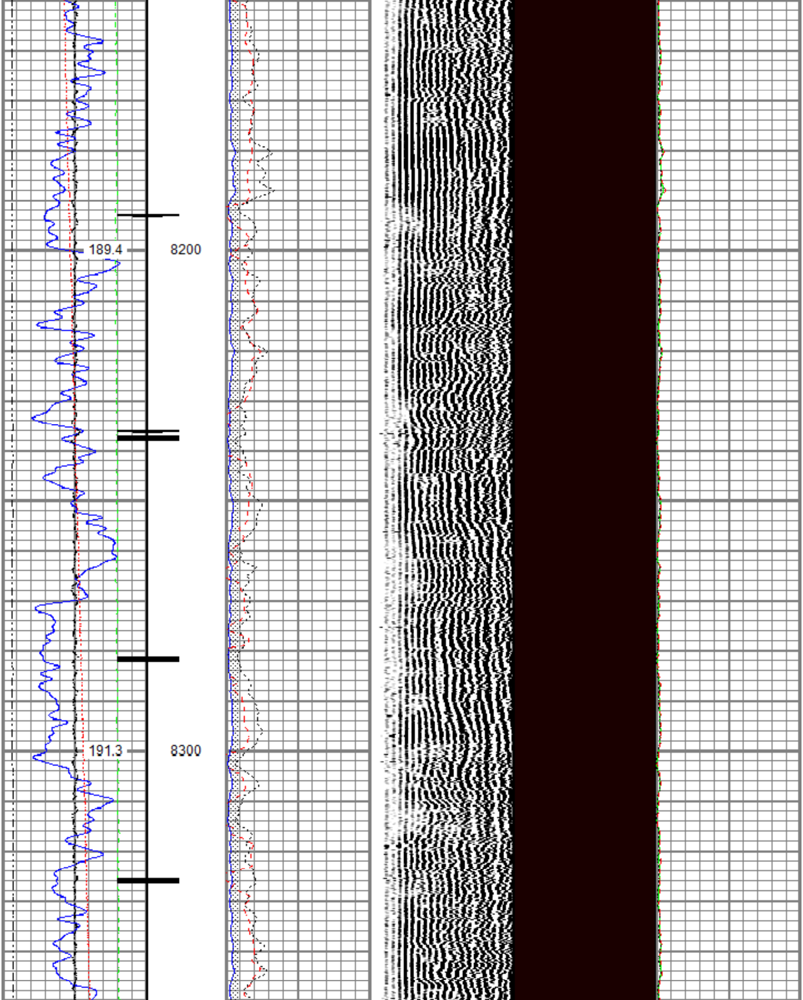
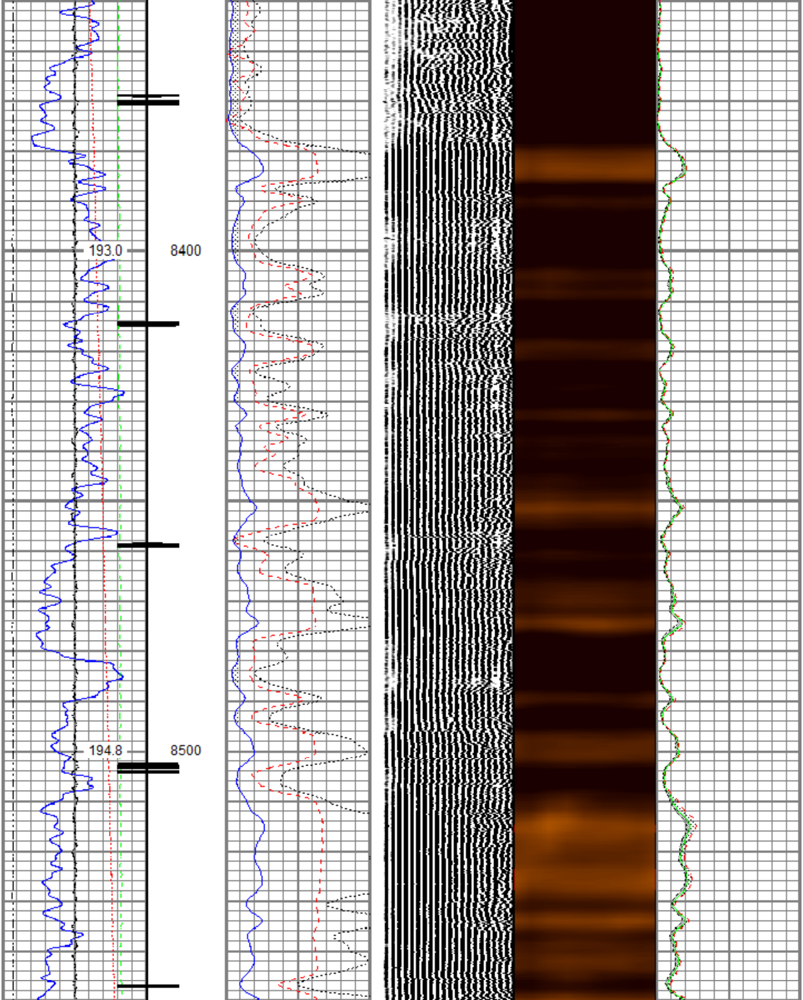
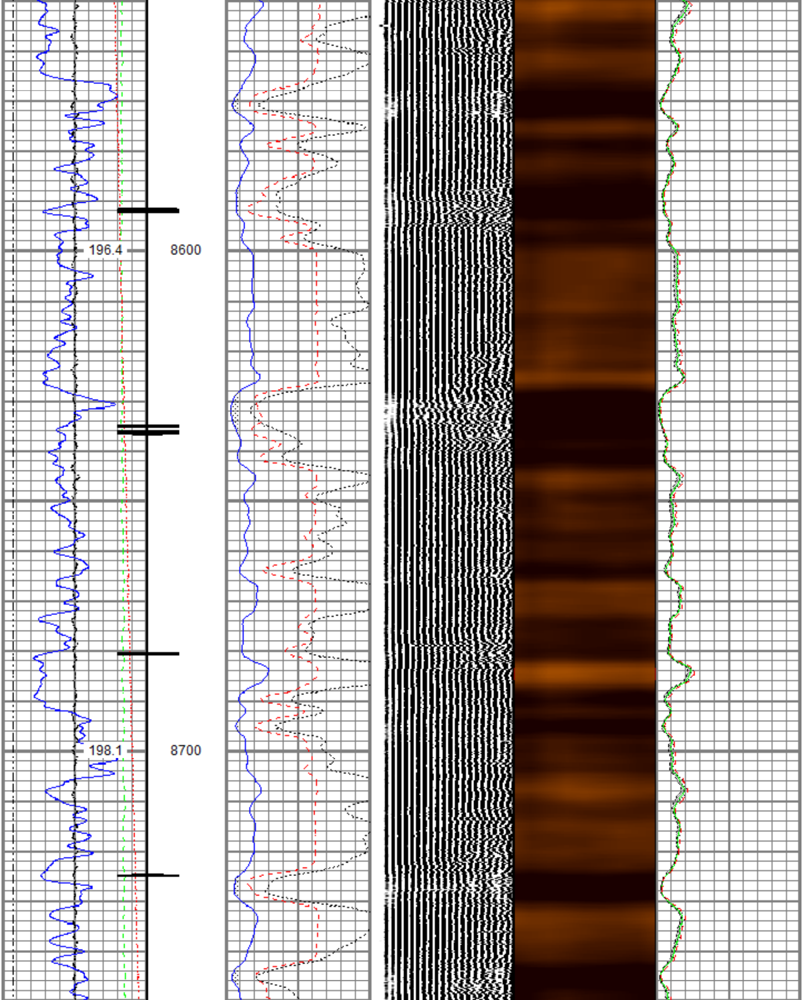
180.6
7700

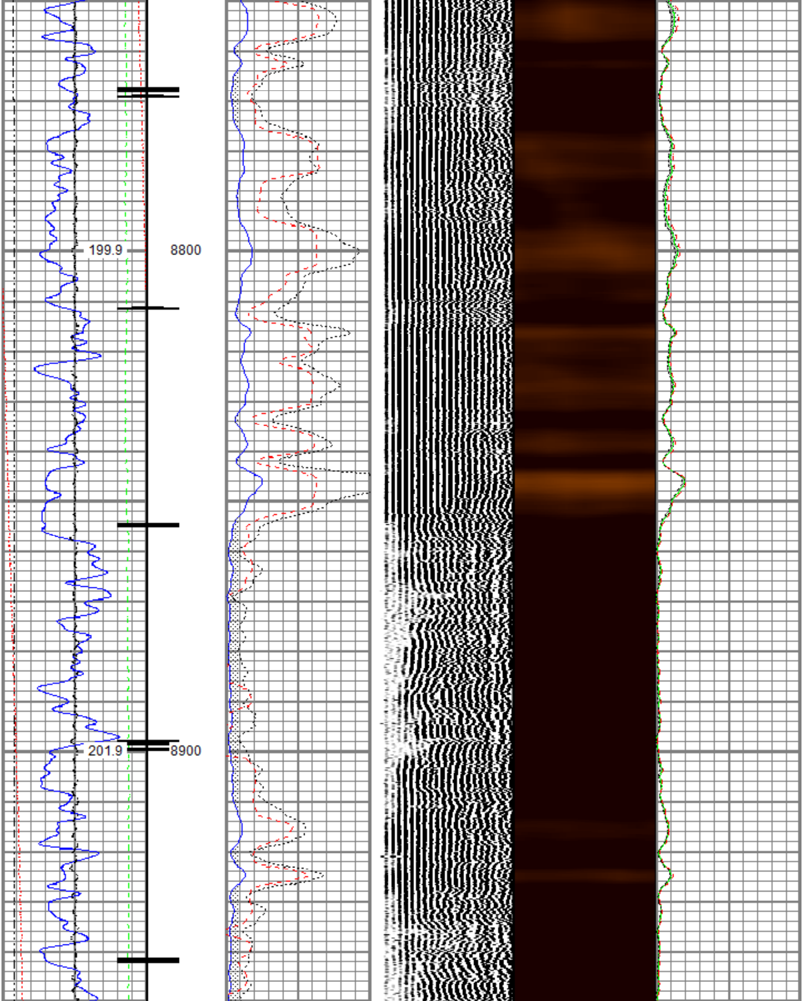


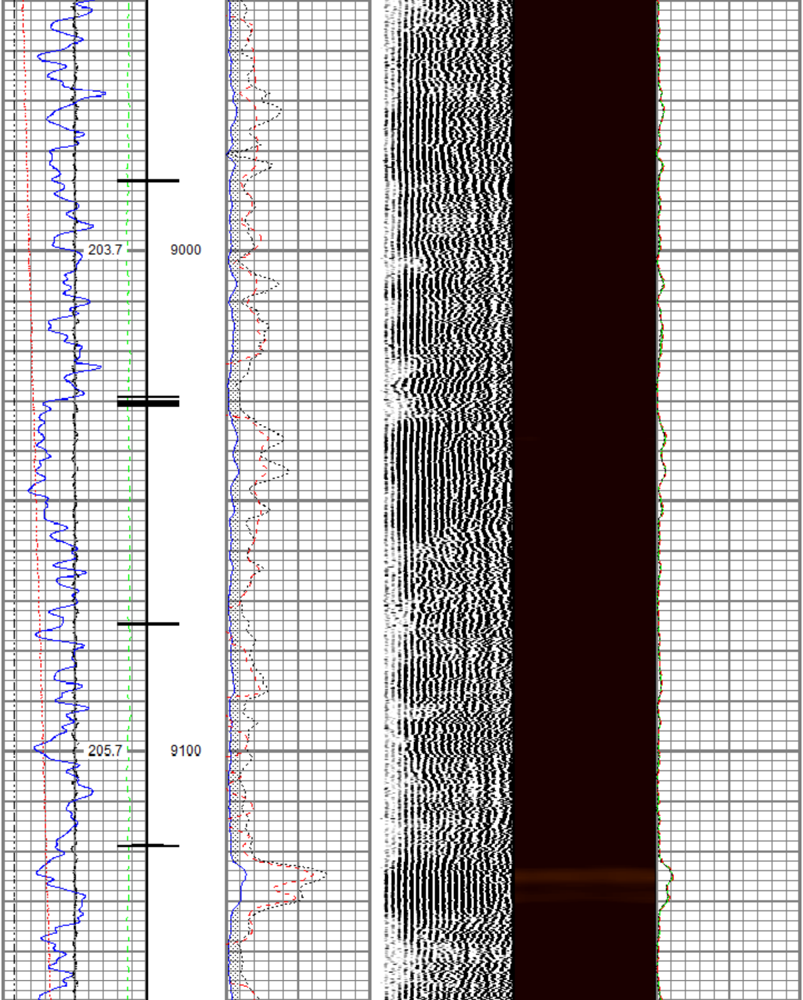


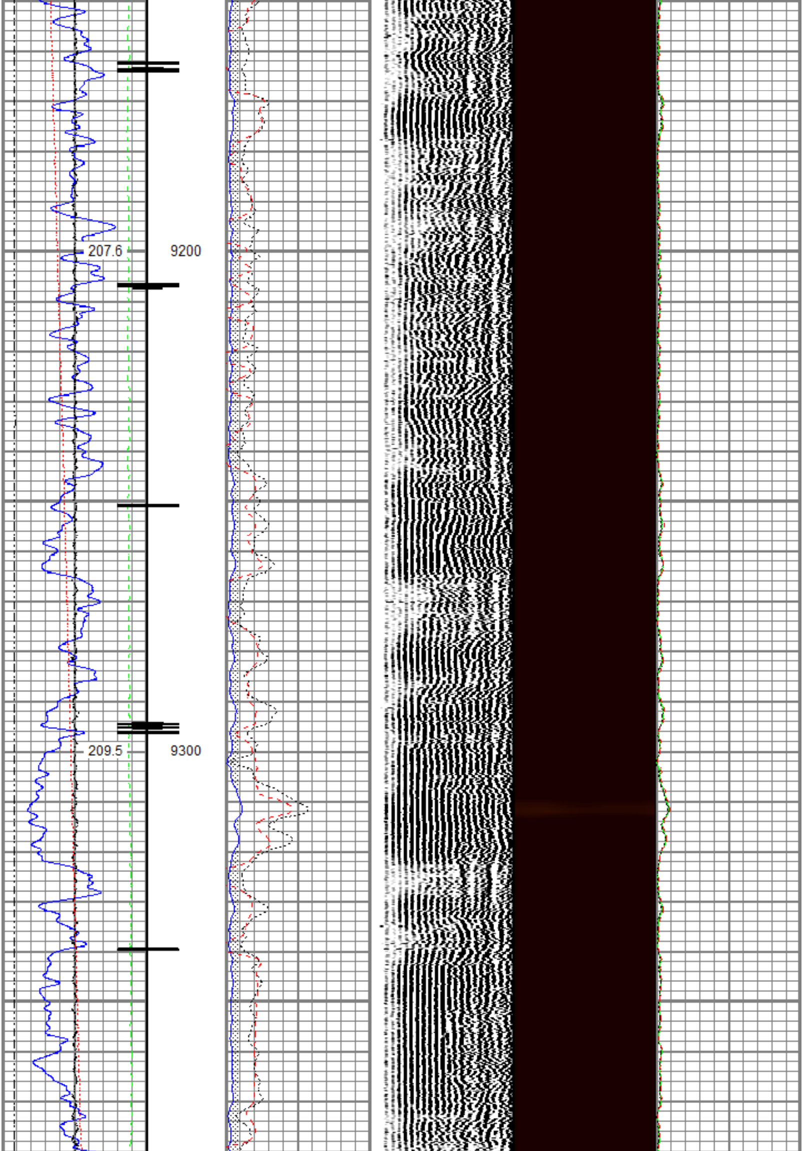


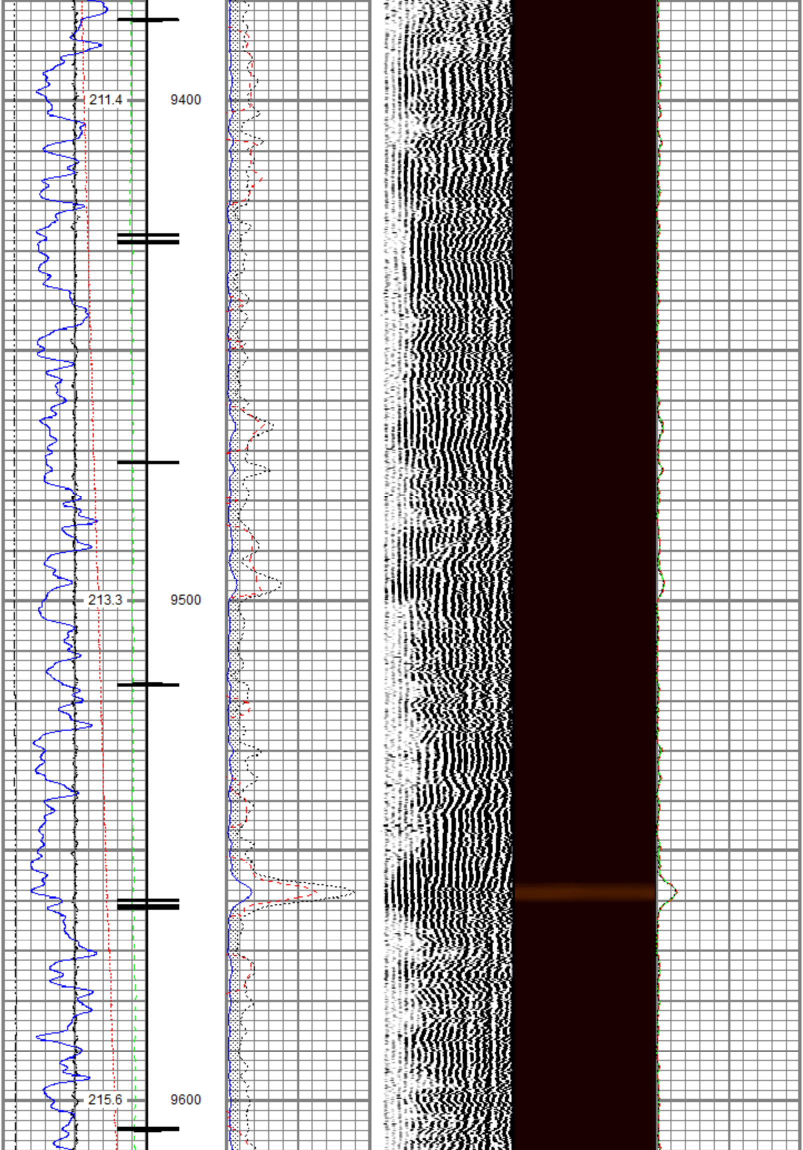


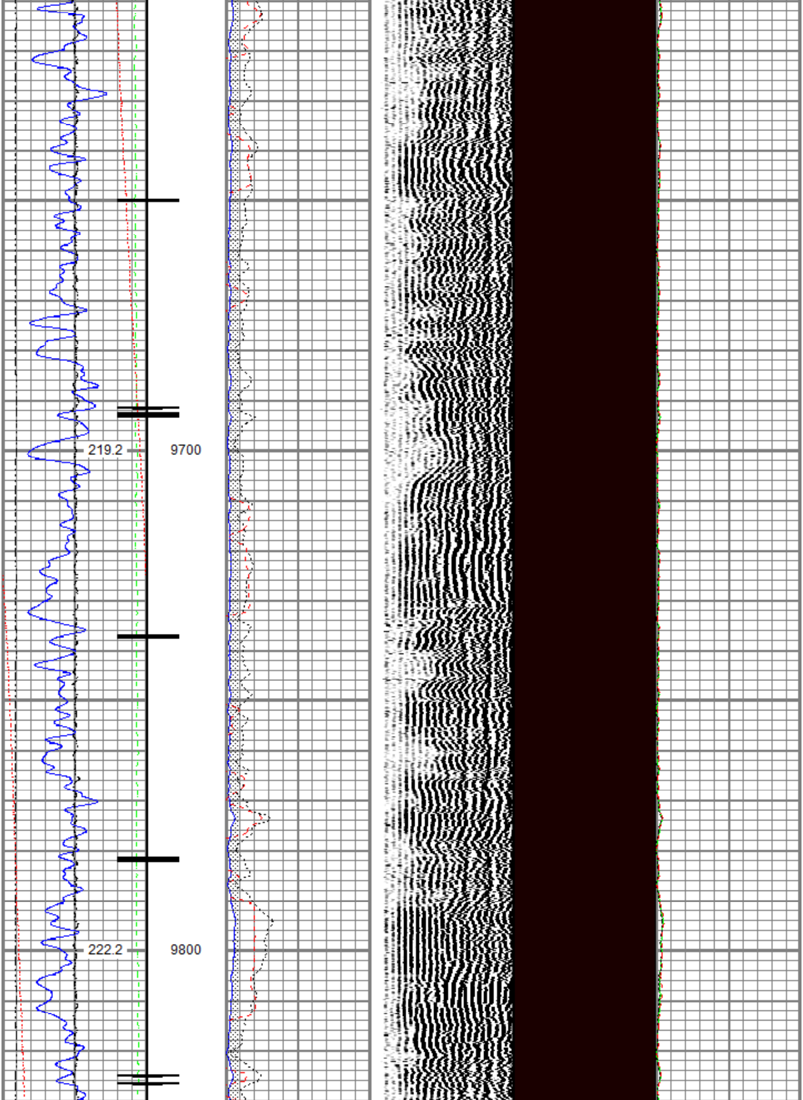


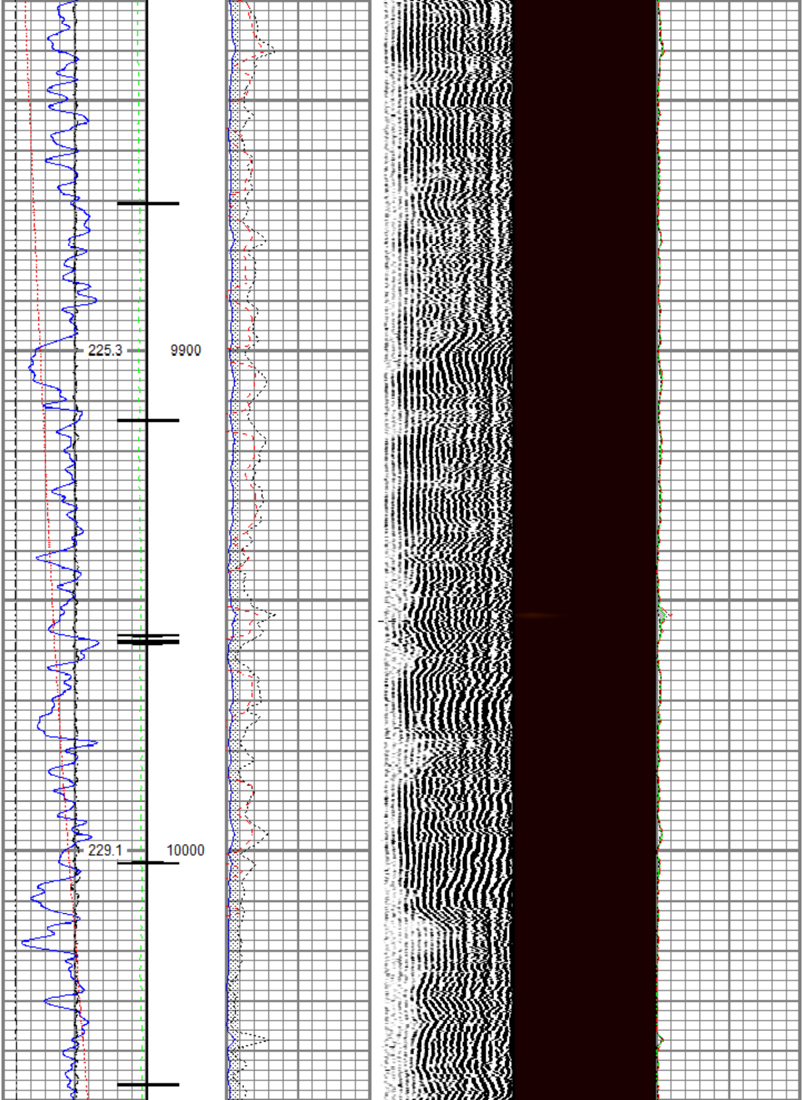


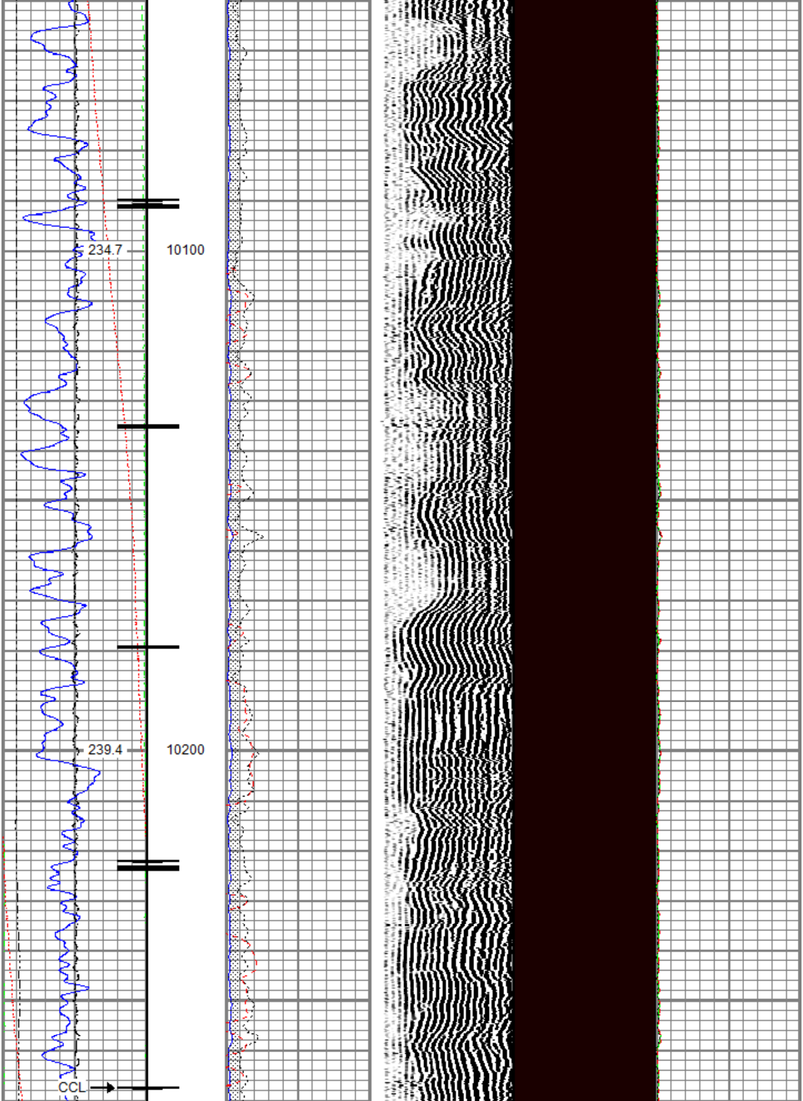


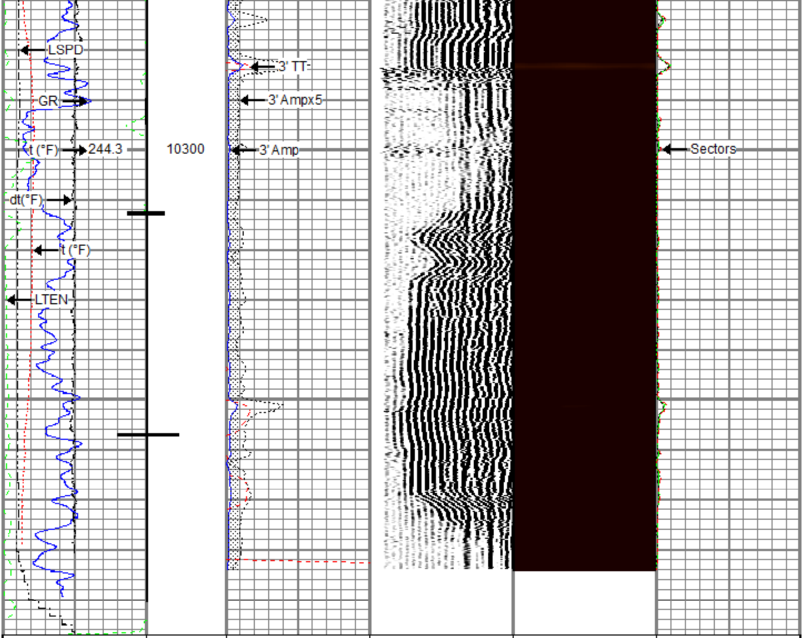












Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 1200	10 110	0 150
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Differential Temperature				
-2 (degF) 2				
Temperature				
0 (degF) 20				
10 *CCL* 0				

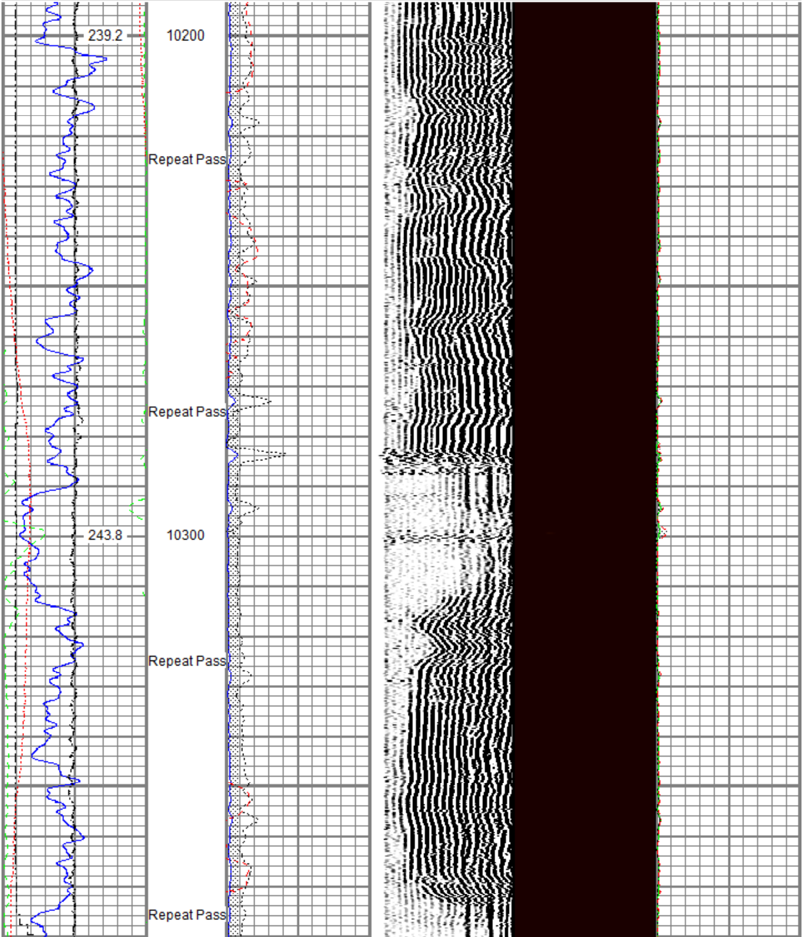
RELIANCE
OILFIELD SERVICES

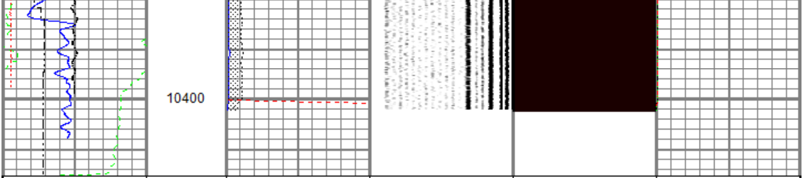
Repeat Pass

Recorded With 0 PSI Surface Induced Pressure

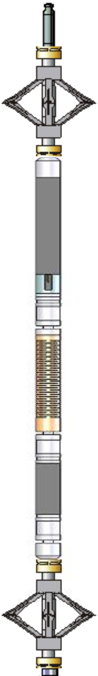
Database File	tep_federal ru 424-17_rbl_06-06-18\tep_federal ru 424-17_rbl_06-06-18.db
Dataset Pathname	repeat.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Wed Jun 06 15:42:40 2018
Charted by	Depth in Feet scaled 1:240

Gamma Ray		3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200		0 (mV) 100	200 1200	10 110	0 150
Line Speed		3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150		0 (mV) 20			0 150
Line Tension		3' Travel Time			MaximumAmplitude
0 (lb) 2000		300 (usec) 200			0 150
Differential Temperature					
-2 (degF) 2					
Temperature					
0 (degF) 20					

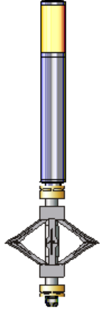




Gamma Ray 0 (GAPI) 200		3' Amplitude 0 (mV) 100	5' Variable Density Log 200 1200	Sector Map 10 110	Average Amplitude 0 150
Line Speed -150 (ft/min) 150		3' Amplitude x 5 0 (mV) 20			MimimumAmplitude 0 150
Line Tension 0 (lb) 2000		3' Travel Time 300 (usec) 200			MaximumAmplitude 0 150
Differential Temperature -2 (degF) 2					
Temperature 0 (degF) 20					

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			Titan CHD-14375 GO Titan 1-7/16" Assembled Electric Cable Head w/ 1" Fishing Neck	1.03	1.44	3.60
			DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
TEMP	16.33					
			Probe Radii-2750 RBT (FW1302-001) Probe 2-3/4" Radial Cement Bond Tool with Integral Temperature Sub	9.39	2.75	105.00
WVFS8	14.10					
WVFS7	14.10					
WVFS6	14.10					
WVFS5	14.10					
WVFS4	14.10					
WVFS3	14.10					
WVFS2	14.10					
WVFS1	14.10					
WVFCAL	14.10					
WVF3FT	14.10					
WVF5FT	13.10					
			DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00

CCL$2	6.42
CCL$1	6.42
GR	5.18



Probe GR-CCL-2750 GOB (FW1307-038) Probe 2-3/4" rev.2 Digital Scintillation Gamma Ray/CCL Combined	4.51	2.75	55.00
DSS RAC-2750 5A GO DSS 2-3/4" Roller 5 Arm Centralizer w/ GO Ends	2.55	2.75	32.00
GO BN-14375 GO 1 7/16" Bull Nose with Go Box Top	0.25	1.44	1.00

Dataset: tep_federal ru 424-17_rbl_06-06-18.db: field/well/run1/mains1.1
Total length: 22.82 ft
Total weight: 260.60 lb
O.D.: 2.75 in

Calibration Report

Database File c:\programdata\warrior\data\tep_federal ru 424-17_rbl_06-06-18\tep_federal ru 424-17_rbl_06-06-18.db
Dataset Pathname mains1.1
Dataset Creation Wed Jun 06 15:31:00 2018

Gamma Ray Calibration Report

Serial Number: FW1307-038
Tool Model: 2750 GOB
Performed: Sun Nov 12 12:44:12 2017

Calibrator Value: 637.0 GAPI

Background Reading: 113.2 cps
Calibrator Reading: 1022.4 cps

Sensitivity: 0.7007 GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number: FW1302-001
Tool Model: 2750 RBT

Calibration Casing Diameter: 4.500 in
Calibration Depth: 424.870 ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.001	1.012	0.800	81.196	79.366	0.873
CAL	-0.005	0.776				
5'	0.007	0.856	0.800	81.196	94.674	0.177
SUM						
S1	0.003	1.177	0.000	100.000	85.183	-0.233
S2	0.000	1.100	0.000	100.000	90.905	-0.029
S3	-0.001	0.961	0.000	100.000	103.938	0.096
S4	-0.003	0.906	0.000	100.000	109.978	0.378
S5	-0.001	0.939	0.000	100.000	106.407	0.114
S6	-0.001	0.962	0.000	100.000	103.881	0.114
S7	-0.000	1.031	0.000	100.000	96.994	0.017
S8	0.001	1.154	0.000	100.000	86.705	-0.052

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.005	0.776	1.000	0.000

Air Zero Calibration, performed (Not Performed):

	Raw (v)	Calibrated (v)	Results
	Zero	Zero	Offset
3'	0.000	0.000	0.000
5'	0.000	0.000	0.000
SUM			
S1	0.000	0.000	0.000
S2	0.000	0.000	0.000
S3	0.000	0.000	0.000
S4	0.000	0.000	0.000
S5	0.000	0.000	0.000
S6	0.000	0.000	0.000
S7	0.000	0.000	0.000
S8	0.000	0.000	0.000

Temperature Calibration Report

Serial Number:	FW1302-001
Tool Model:	2750 RBT
Performed:	Sun Nov 12 13:24:58 2017

	Reference	Reading
Low Reference:	100.00 degF	107.47 degF
High Reference:	350.00 degF	404.08 degF

Gain:	0.84
Offset:	9.42
Delta Spacing	1

RELIANCE
OILFIELD SERVICES

Company	TEP Rocky Mountain LLC
Well	Federal RU 424-17
Field	Rulison
County	Garfield
State	Colorado