RELIANCE
OILFIELD SERVICES

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal GM 513-4
Field	Grand Valley
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC
Well Federal GM 513-4
Field Grand Valley
County Garfield State Colorado

Location: API #: 05-045-23507
SEC 5 TWP 7S RGE 96W

Other Services
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Elevation
K.B. 6001'
D.F. 6000'
G.L. 5977'

Permanent Datum Ground Level Elevation 5977'
Log Measured From Kelly Bushing 24 FT
Drilling Measured From Kelly Bushing

Date	28-OCT-2017
Run Number	One
Depth Driller	7066 FT
Depth Logger	6989 FT
Bottom Logged Interval	6984 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Fresh Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	203°F
Estimated Cement Top	See Log
Time Well Ready	ROA
Time Logger on Bottom	15:30
Equipment Number	HD-359
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	1022 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	7023 FT
Intermediate #2					
Liner					

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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
Ground Level 1 FT below top of cut pipe
Marker Joint logged at 4739 FT- 4762 FT
Log ran from 6989 FT to Surface
Recorded with 0 PSI Surface Induced Pressure

Thank you for choosing Reliance Oilfield Services, LLC!!

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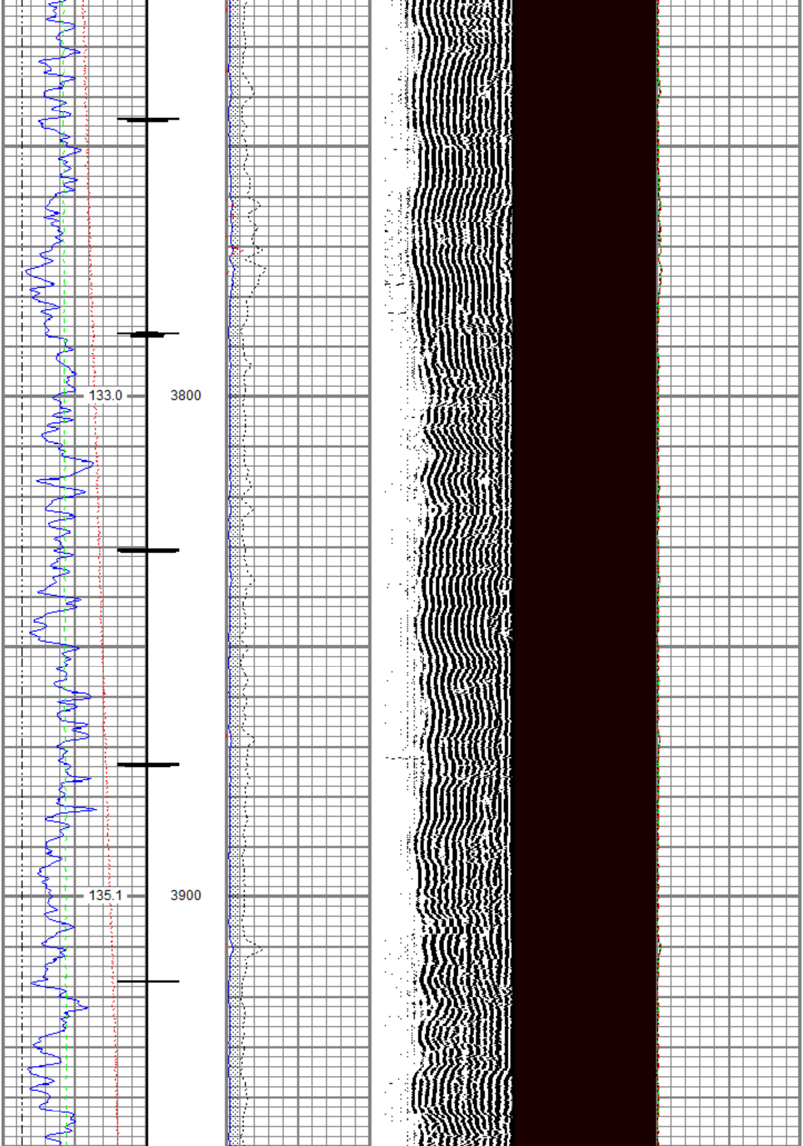
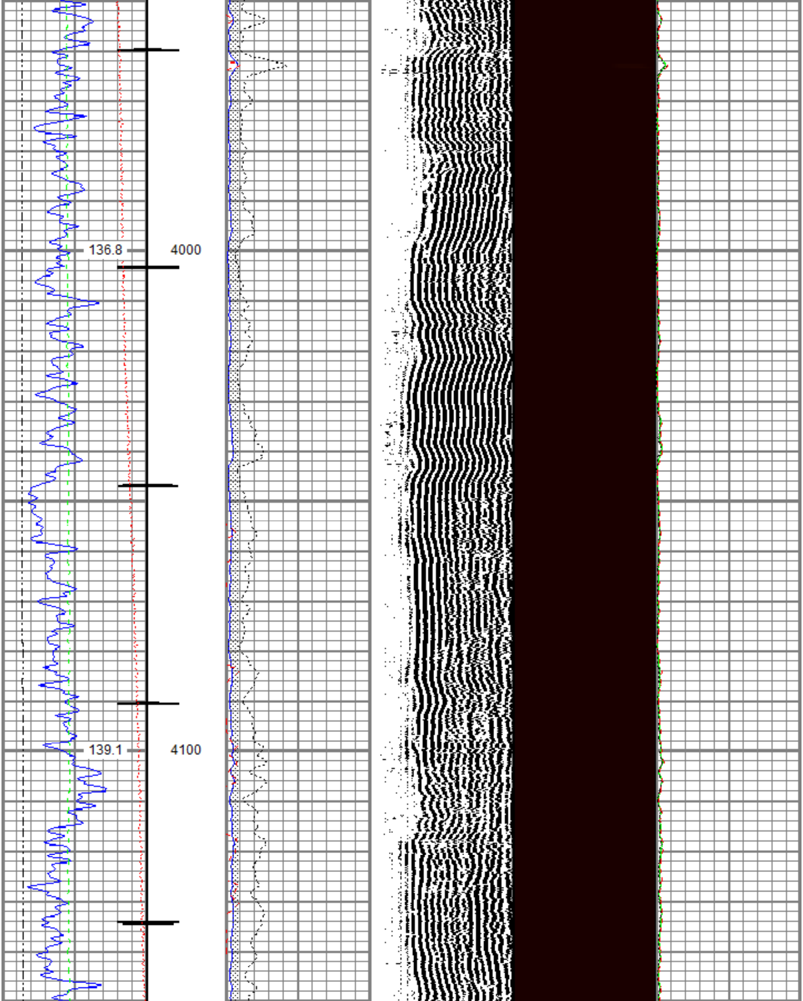
Main Pass

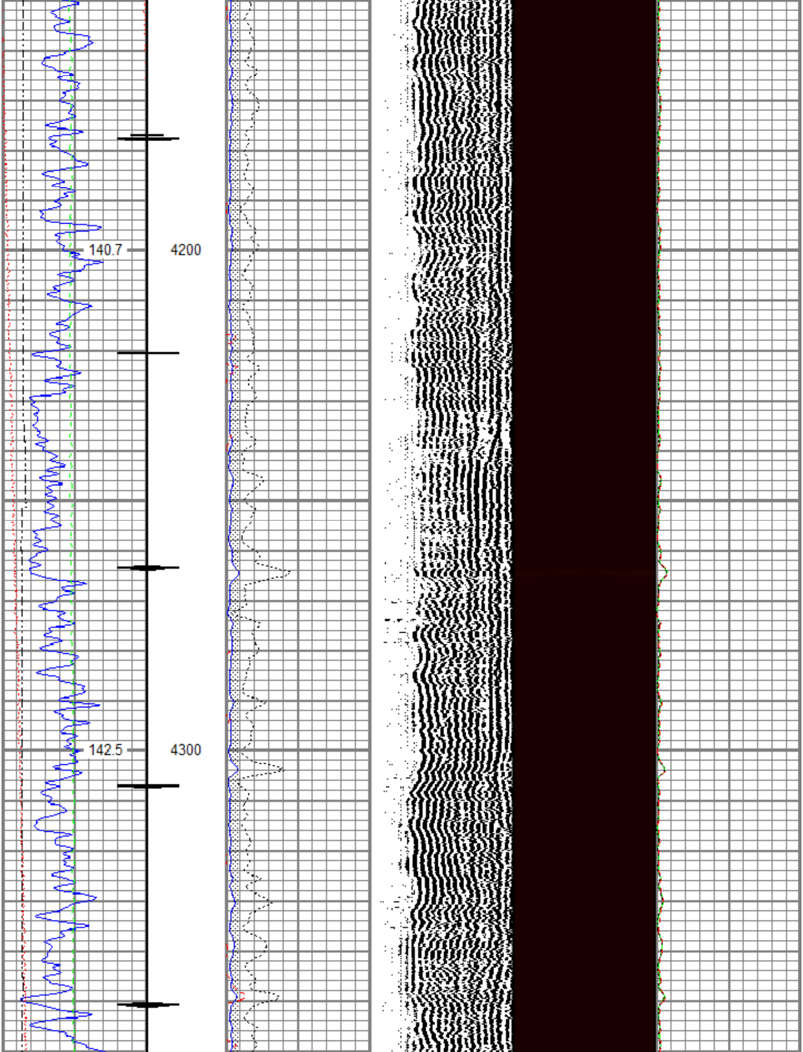
Recorded with 0 PSI Surface Induced Pressure

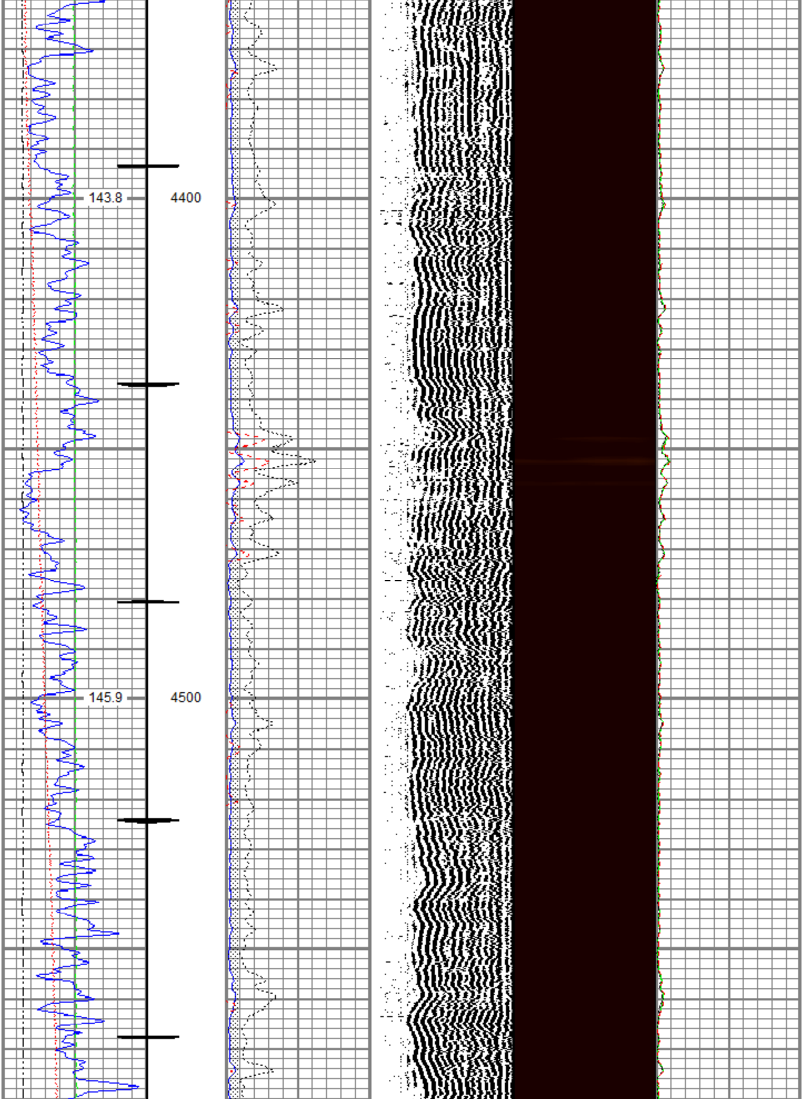
Database File	tep_federal gm 513-4_rbl_10-28-17\processed_tep_federal gm 513-4_rbl_10-28-17.db
Dataset Pathname	Main.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Tue Oct 31 10:29:25 2017
Charted by	Depth in Feet scaled 1:240

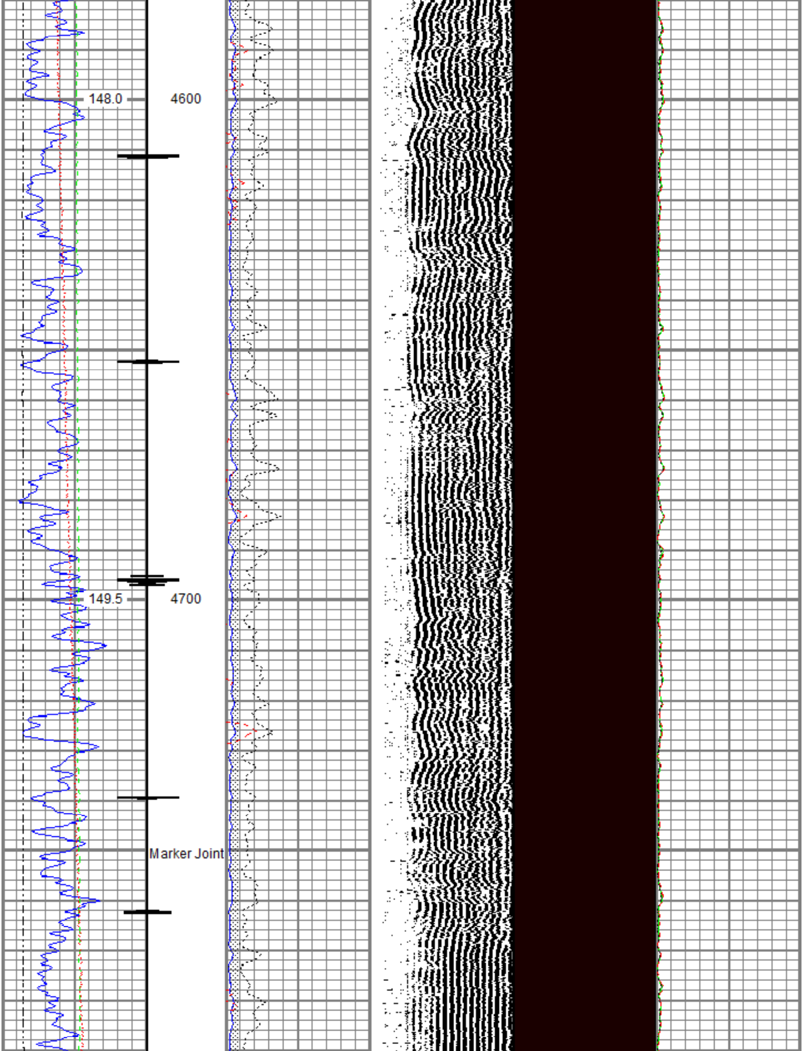
Gamma Ray 0 (GAPI) 200 Casing Collar Locator Line Speed -150 (ft/min) 150 Line Tension 0 (lb) 2000 Temperature 0 (degF) 20		3' Amplitude 0 (mV) 100 3' Amplitude x 5 0 (mV) 20 3' Travel Time 300 (usec) 200	5' Variable Density Log 200 1200	Sector Map 10 110	Average Amplitude 0 150 Mimimum Amplitude 0 150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

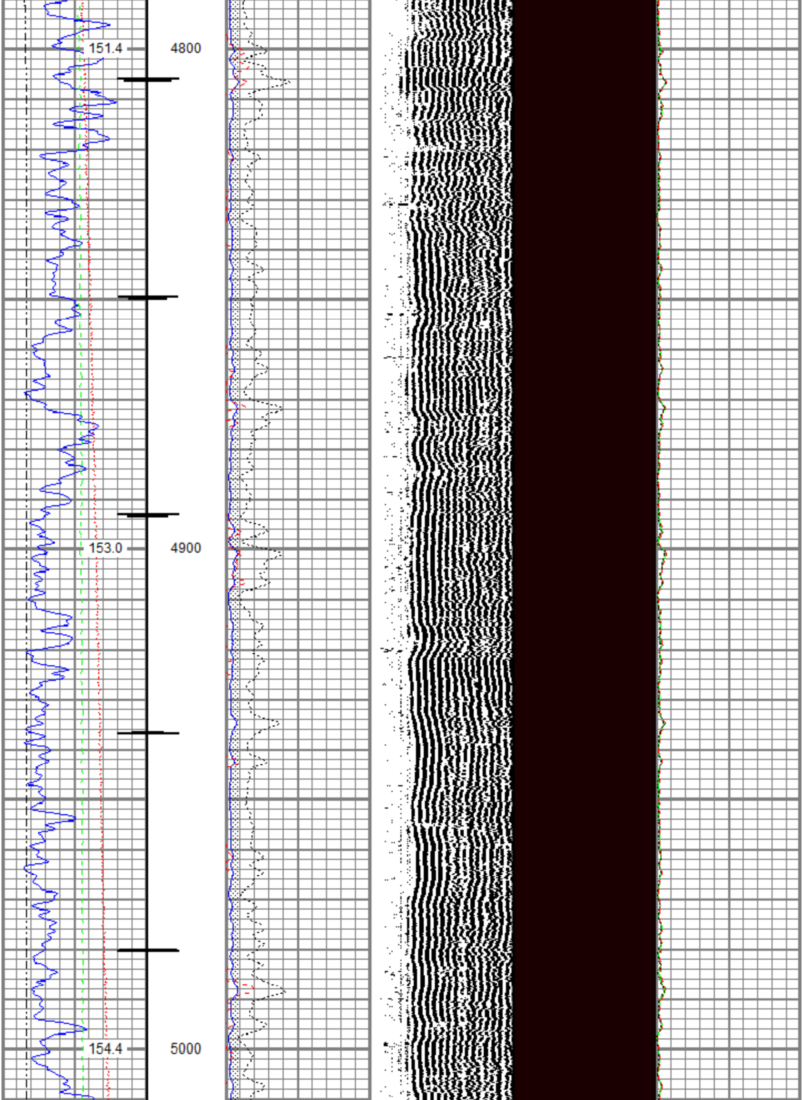


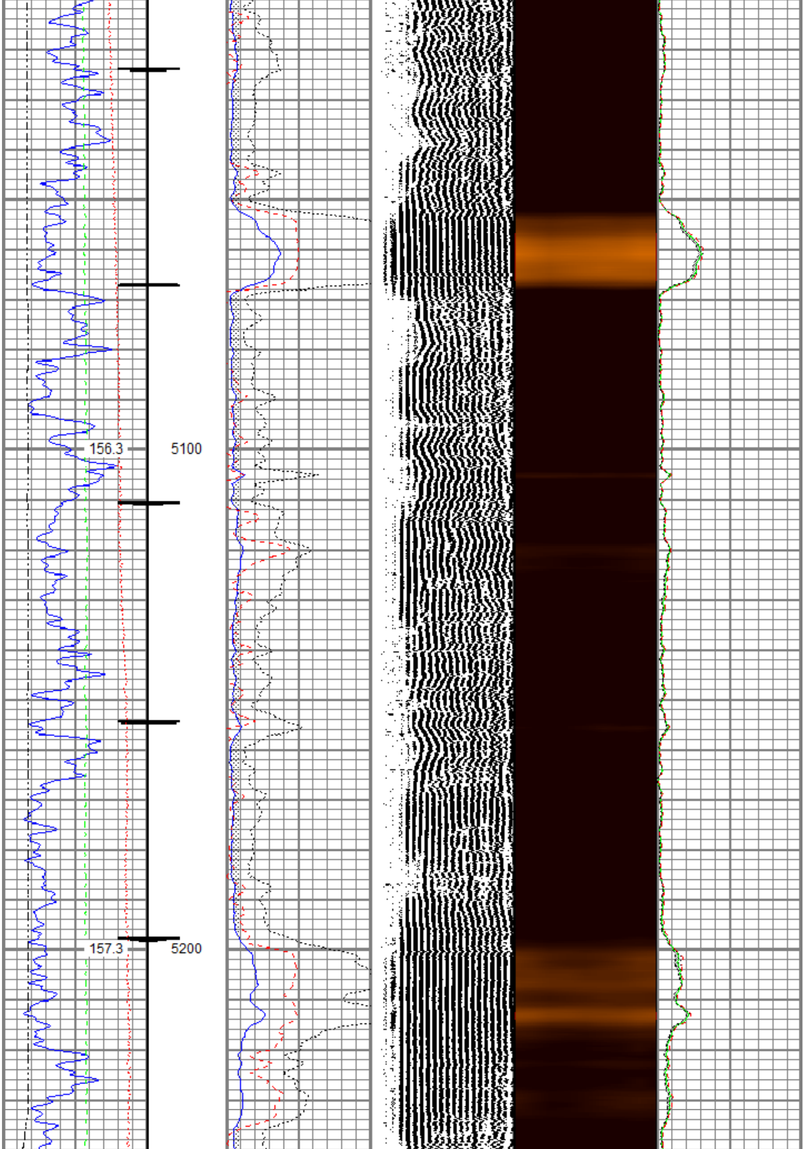


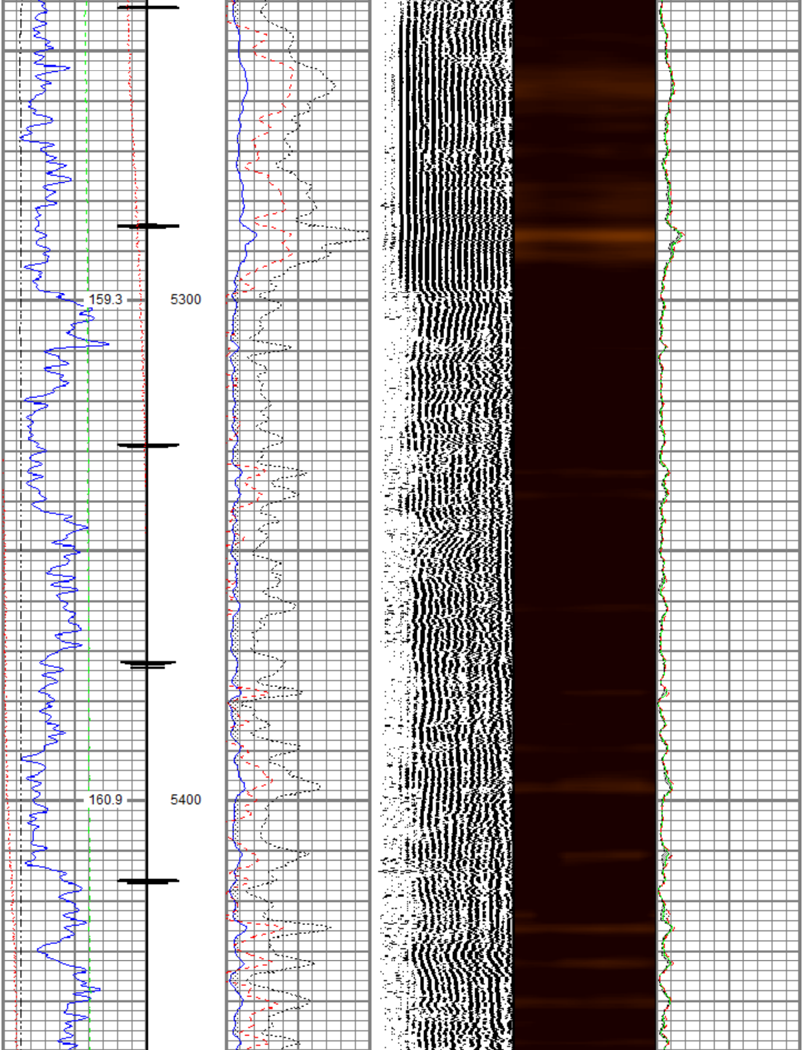


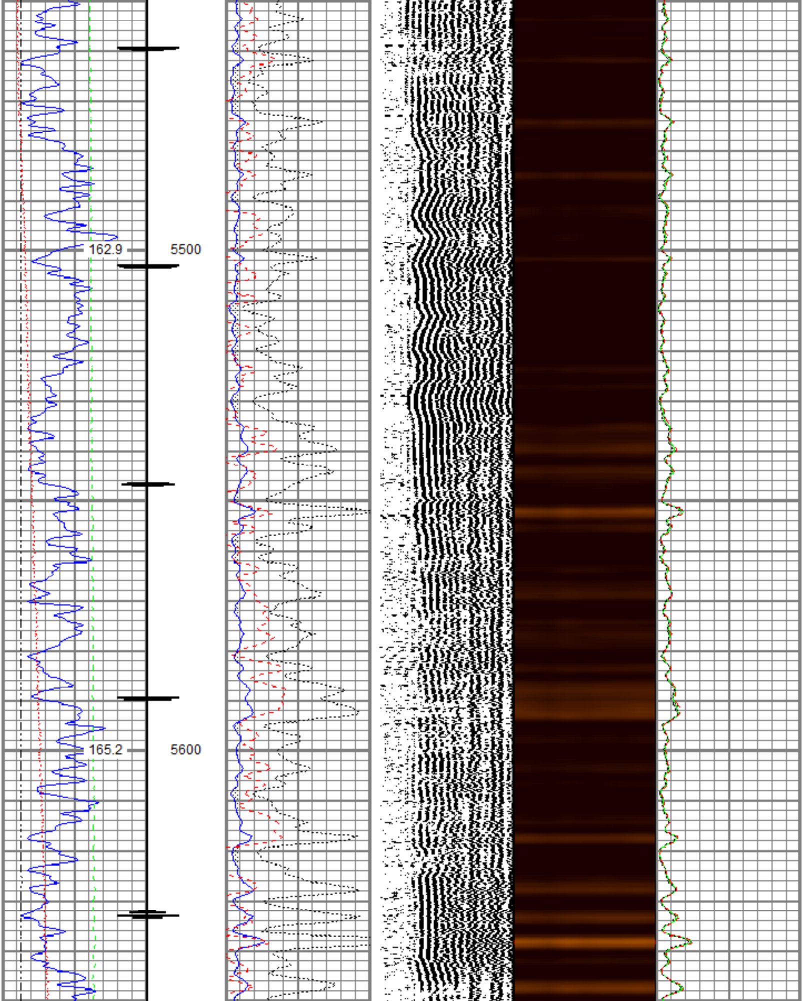


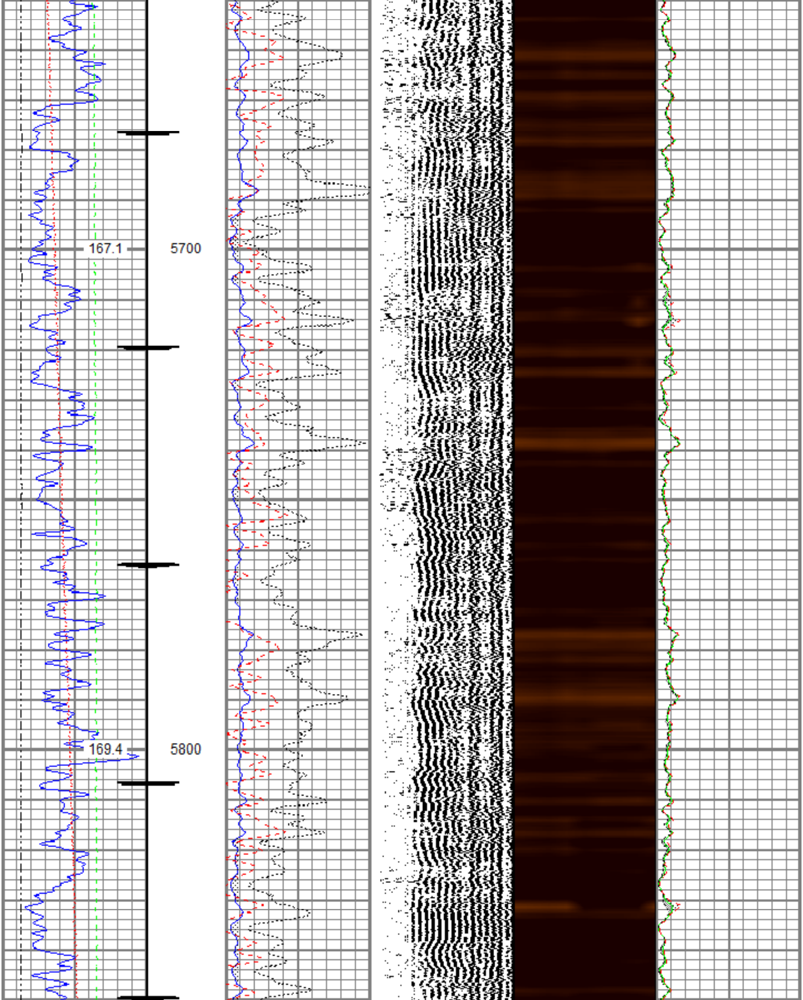


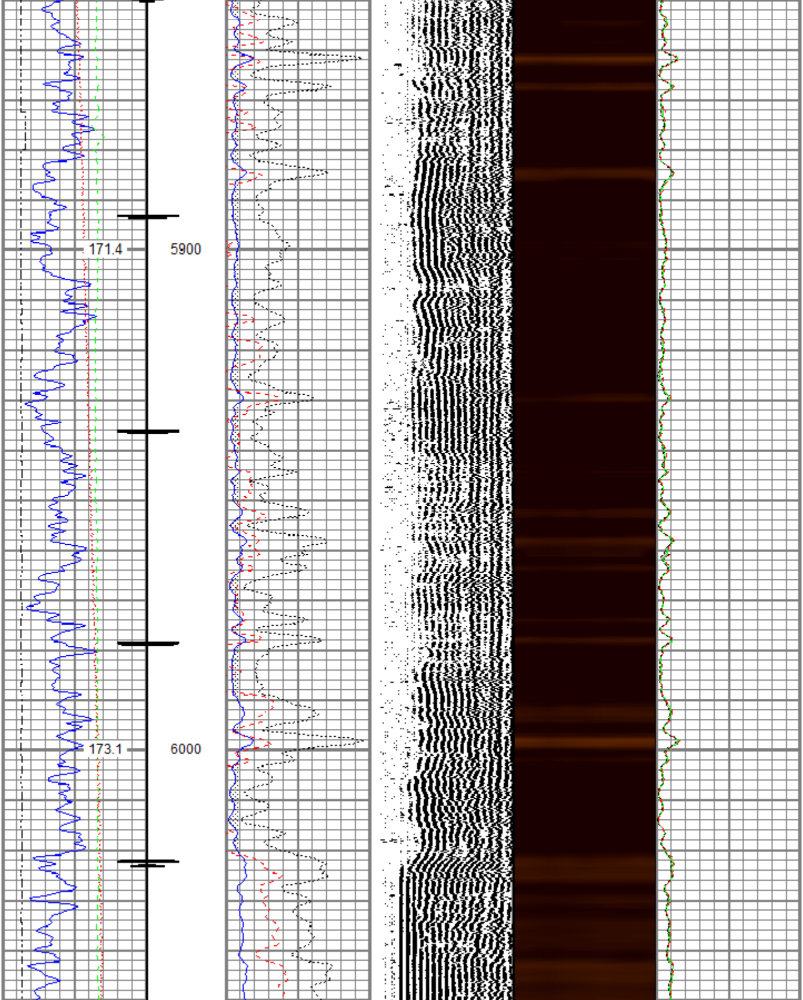


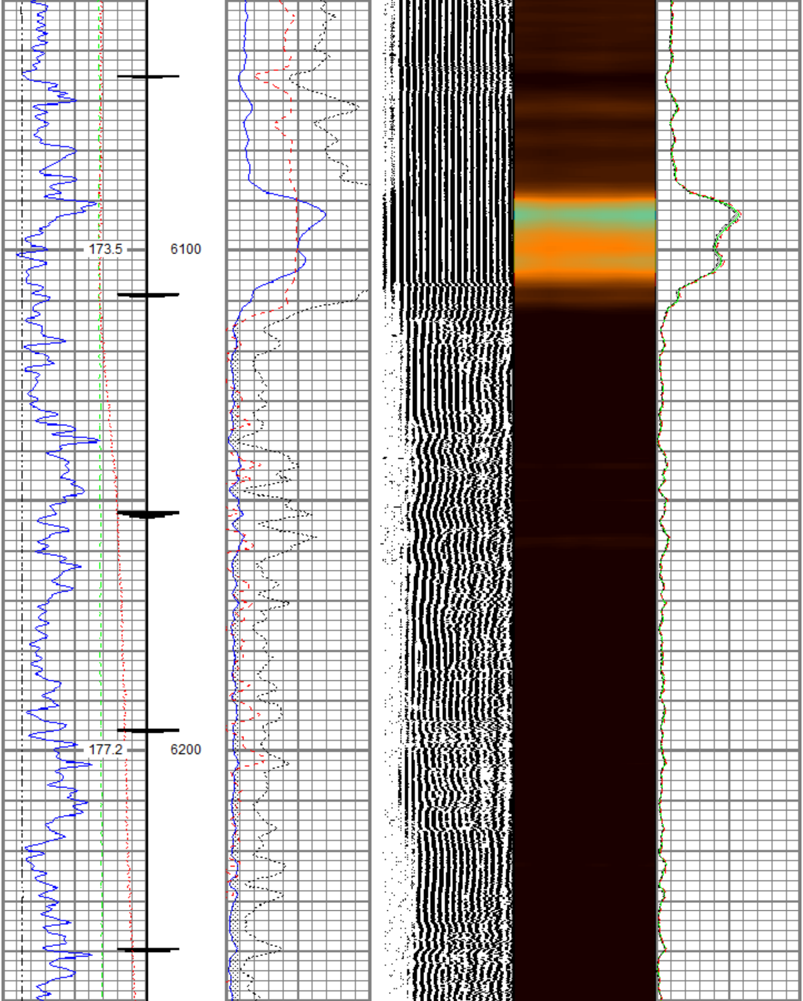


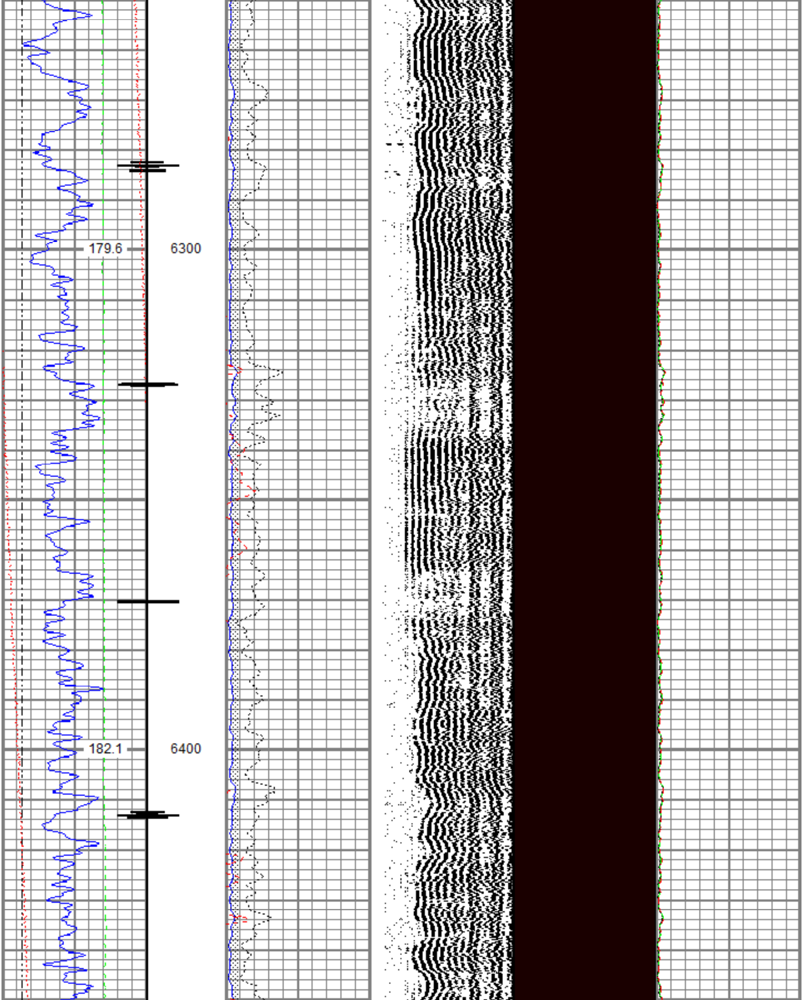


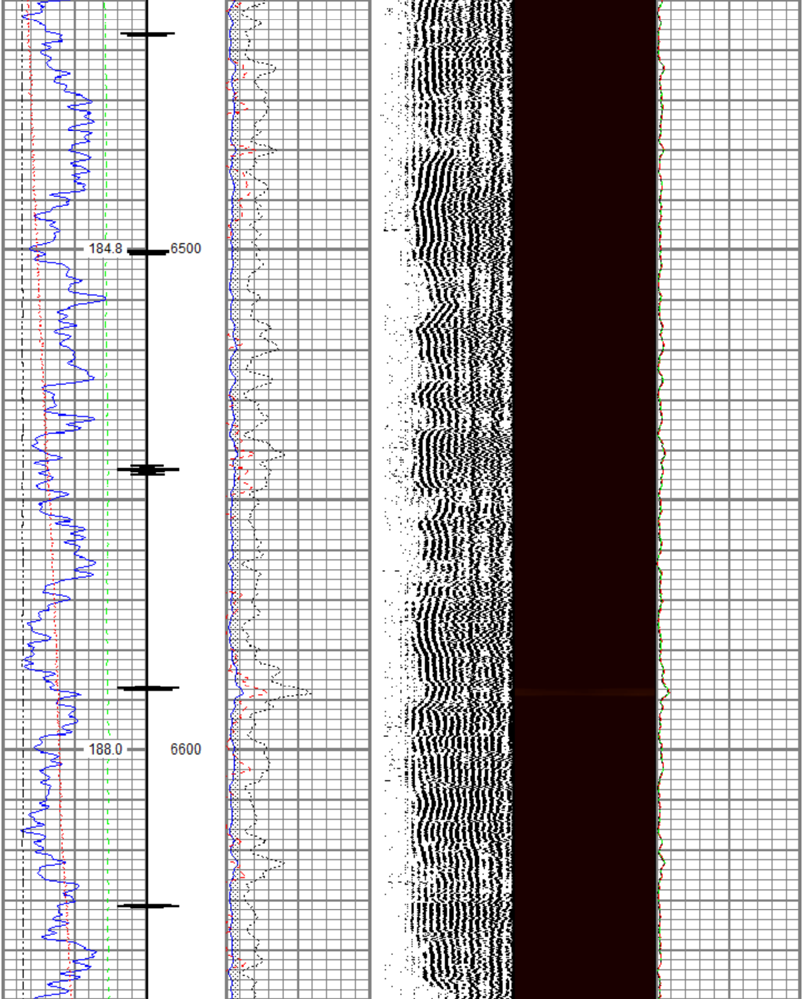


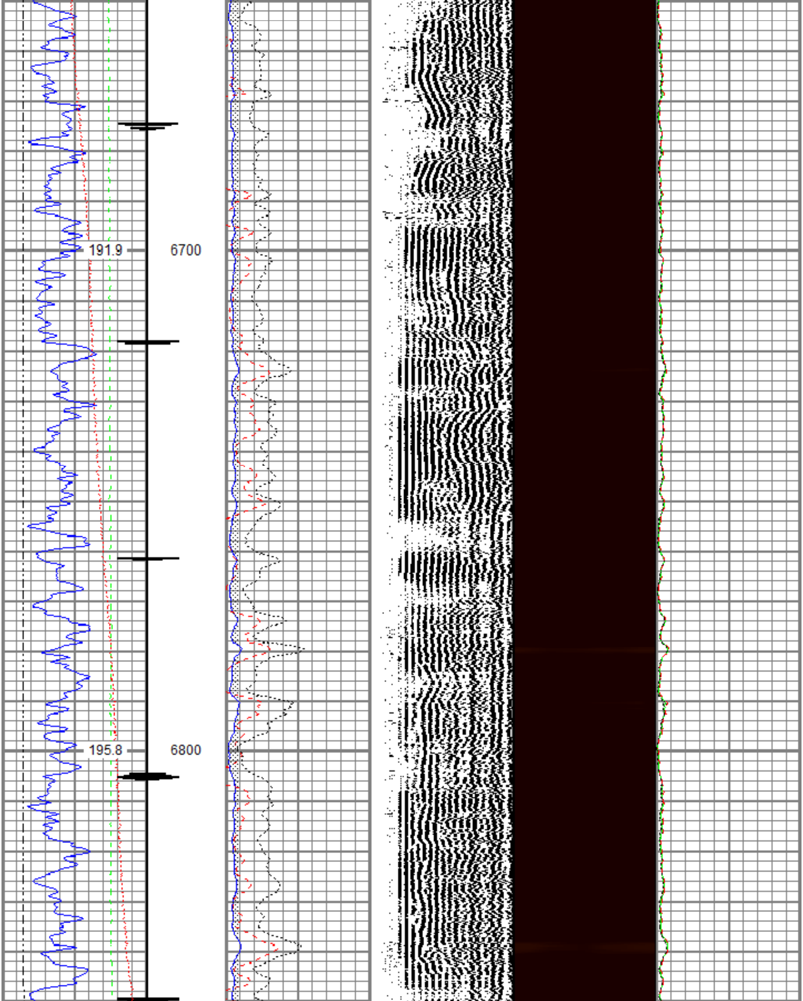


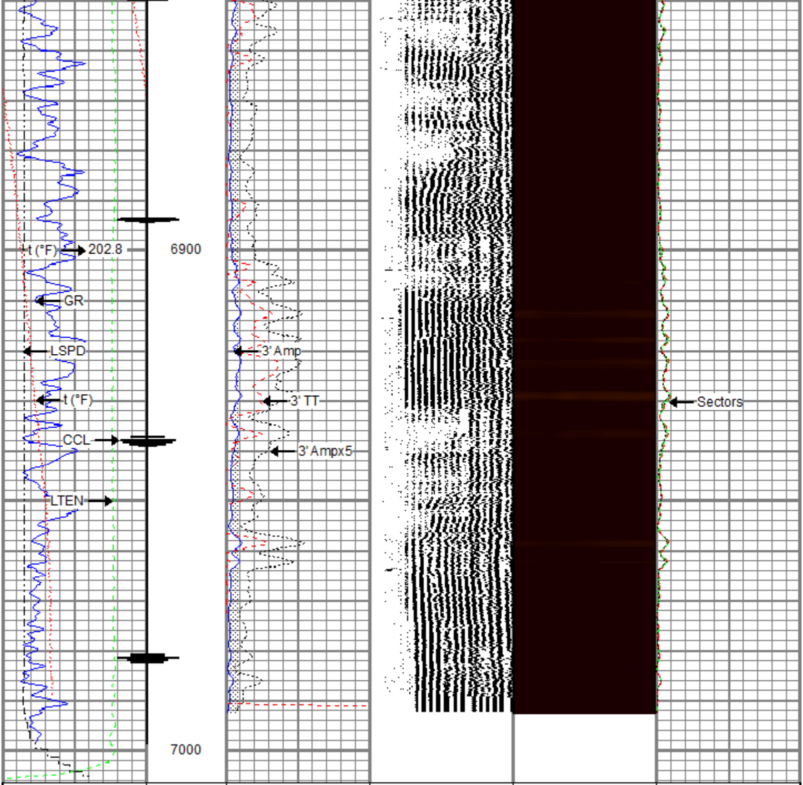












Gamma Ray 0 (GAPI) 200 Casing Collar Locator Line Speed -150 (ft/min) 150 Line Tension 0 (lb) 2000 Temperature 0 (degF) 20		3' Amplitude 0 (mV) 100 3' Amplitude x 5 0 (mV) 20 3' Travel Time 300 (usec) 200	5' Variable Density Log 200 1200	Sector Map 10 110	Average Amplitude 0 150 Mimimum Amplitude 0 150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

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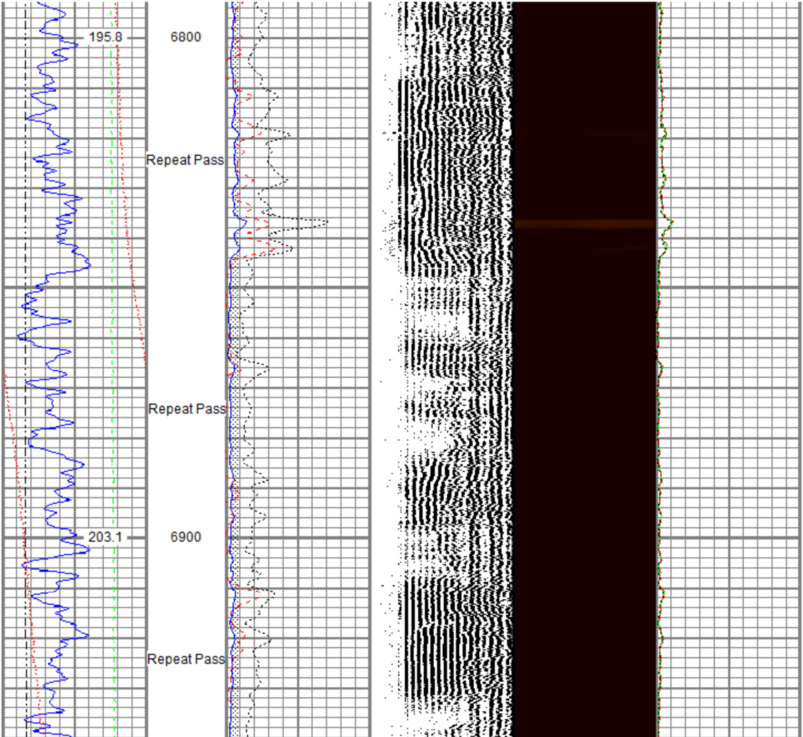
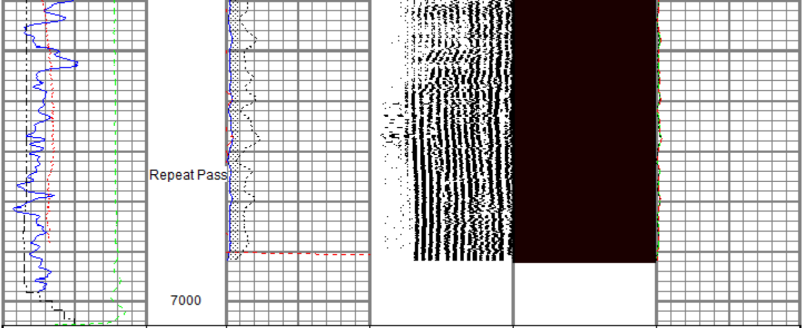
Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

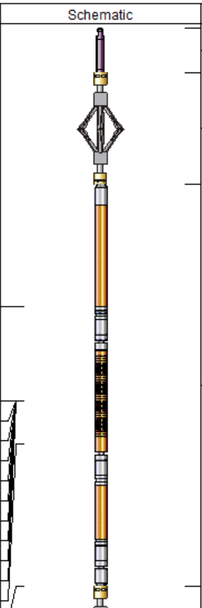
Database File	tep_federal gm 513-4_rbl_10-28-17\processed_tep_federal gm 513-4_rbl_10-28-17.db
Dataset Pathname	Repeat.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Tue Oct 31 10:38:57 2017
Charted by	Depth in Feet scaled 1:240

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			Mimimum Amplitude 0 150
Line Tension 0 (lb) 2000		3' Travel Time 300 (usec) 200			Maximum Amplitude 0 150
Temperature 0 (degF) 20					

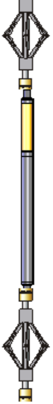




Gamma Ray	3' Amplitude	5' Variable Density Log	Sector Map	Average Amplitude
0 (GAPI) 200	0 (mV) 100	200 1200	10 110	0 150
Line Speed	3' Amplitude x 5			Mimimum Amplitude
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Temperature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



Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			Titan_Electric_Cable_Heads-Titan_1-11/1 Electric Cable Head with 1" Fishing Neck	1.03	1.69	5.40
			DSS_RAC-RAC_5-Arm 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00
Temp	16.05					
WVFS8	13.88		Probe_RADII-C-P_RBT_2750 (FW1305-0 Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe	9.19	2.75	105.00
WVFS7	13.88					
WVFS6	13.88					
WVFS5	13.88					
WVFS4	13.88					
WVFS3	13.88					
WVFS2	13.88					
WVFS1	13.88					
WVFCAL	13.88					
WVF3FT	13.88					
WVF5FT	12.88					



HeadVolt	9.63				
		DSS_RAC-RAC_5-Arm 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00
DCCL	6.18				
CCL	6.18				
GR	4.96				
		Probe_GR_CCL-P_CGR_2750_S (FW1214.541) Probe 2-3/4" Digital CCL / Gamma Ray Combined		2.75	55.00
		DSS_RAC-RAC_5-Arm 5 Arm 2-3/4" Roller Centralizer	2.55	2.75	32.00

Dataset: processed_tep_federal gm 513-4_rbl_10-28-17.db: field/well/run1/Main.1
Total length: 22.40 ft
Total weight: 261.40 lb
O.D.: 2.75 in

Calibration Report

Database File c:\programdata\warrior\data\tep_federal gm 513-4_rbl_10-28-17\processed_tep_federal gm 513-4_rbl_10-28
Dataset Pathname Main.1
Dataset Creation Tue Oct 31 10:29:25 2017

Gamma Ray Calibration Report

Serial Number: FW1211-081
Tool Model: P_CGR_2750_S
Performed: Sat Feb 06 11:31:52 2016

Calibrator Value: 1.0 GAPI

Background Reading: 0.0 cps
Calibrator Reading: 1.6 cps

Sensitivity: 0.6061 GAPI/cps

Segmented Cement Bond Log Calibration Report

Serial Number: FW1305-098
Tool Model: P_RBT_2750

Calibration Casing Diameter: 4.500 in
Calibration Depth: 87.053 ft

Master Calibration, performed (Derived):

Raw (v)	Calibrated (mv)	Results

	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.006	0.930	0.800	81.196	85.902	1.284
CAL	0.816	0.829				
5'	-0.014	0.866	0.800	81.196	91.336	2.095
SUM						
S1	-0.009	0.905	0.000	100.000	109.450	0.938
S2	-0.008	0.980	0.000	100.000	101.279	0.785
S3	-0.005	1.032	0.000	100.000	96.408	0.500
S4	-0.006	1.013	0.000	100.000	98.163	0.597
S5	-0.007	0.992	0.000	100.000	100.047	0.720
S6	-0.009	0.950	0.000	100.000	104.276	0.940
S7	-0.012	0.910	0.000	100.000	108.419	1.318
S8	-0.004	0.877	0.000	100.000	113.408	0.500

Internal Reference Calibration, performed Fri May 05 10:29:14 2017:

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	0.816	0.829	1.000	0.000

Air Zero Calibration, performed Sat Oct 28 08:12:44 2017:

	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

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County	Garfield
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