RELIANCE OILFIELD SERVICES

Radial Cement Bond Gamma Ray Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal GM 443-5
Field	Grand Valley
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC
Well Federal GM 443-5
Field Grand Valley
County Garfield State Colorado
Location: API # : 05-045-22666
SEC 5 TWP 7S RGE 96W

Other Services

			Elevation
Permanent Datum	Ground Level	Elevation 5977'	K.B. 6001'
Log Measured From	Kelly Bushing	24 FT	D.F. 6000'
Drilling Measured From	Kelly Bushing		G.L. 5977'

Date	28-OCT-2017
Run Number	One
Depth Driller	6705 FT
Depth Logger	6628 FT
Bottom Logged Interval	6623 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	10:25
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	1050 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	6658 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 4197 FT- 4220 FT
Log ran from 6628 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 443-5_rbl_10-28-17\processed_tep_federal gm 443-5_rbl_10-28-17.db
Dataset Pathname	Main.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Mon Oct 30 16:36:17 2017
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
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 150
-150 (ft/min) 150	3' Travel Time			Maximum Amplitude
Line Tension	300 (usec) 200			0 150
0 (lb) 2000				
Temperature				
0 (degF) 20				

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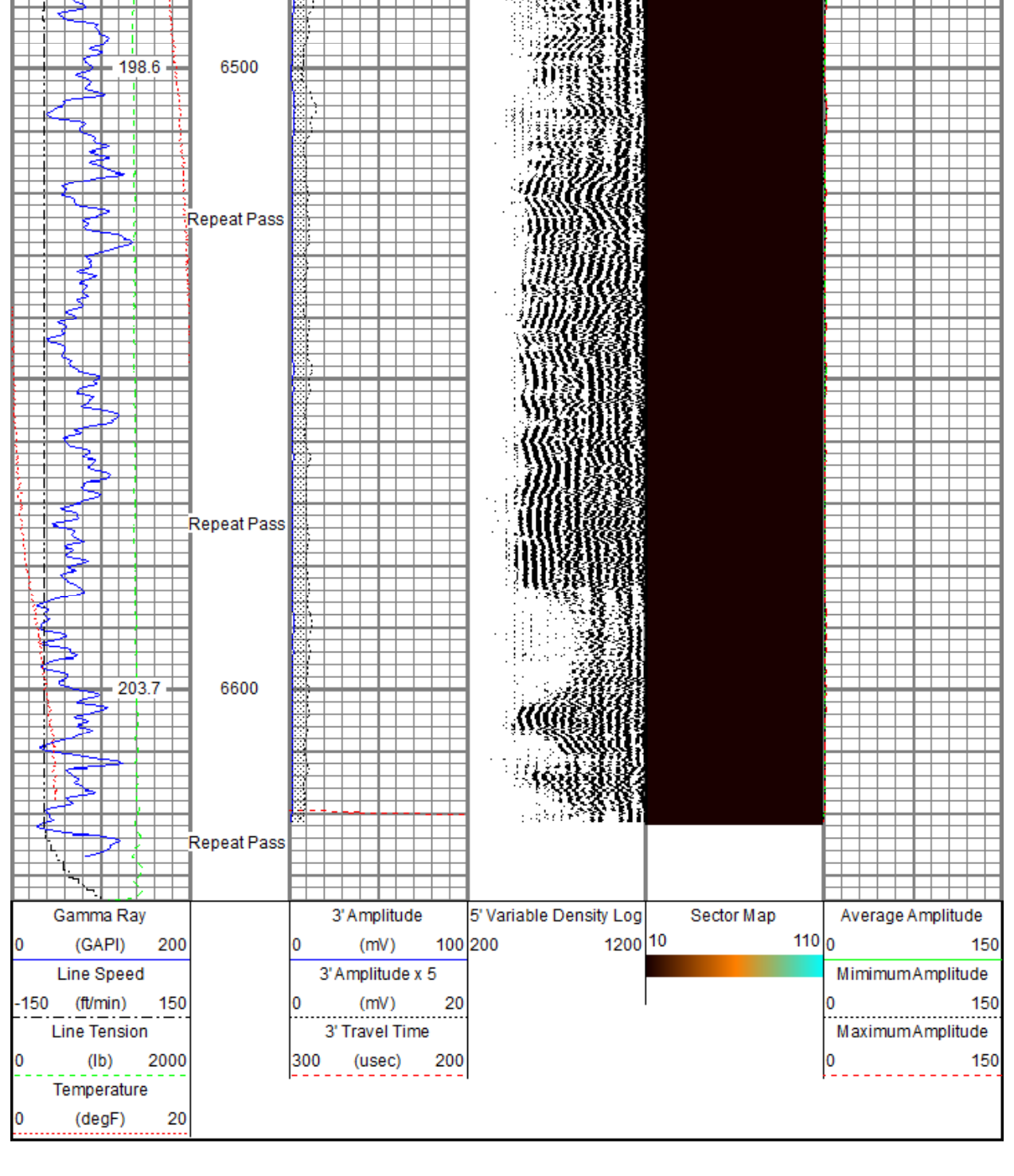
Casing Collar Locator	3' Amplitude x 5			Mimimum Amplitude
Line Speed	0 (mV) 20			0 150
-150 (ft/min) 150	3' Travel Time			Maximum Amplitude
Line Tension	300 (usec) 200			0 150
0 (lb) 2000				
Temperature				
0 (degF) 20				

Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

Database File tep_federal gm 443-5_rbl_10-28-17\processed_tep_federal gm 443-5_rbl_10-28-17.db
Dataset Pathname Repeat.1
Presentation Format ros_rbt004_tep
Dataset Creation Mon Oct 30 16:50:57 2017
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			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Temperature				
0 (degF) 20				



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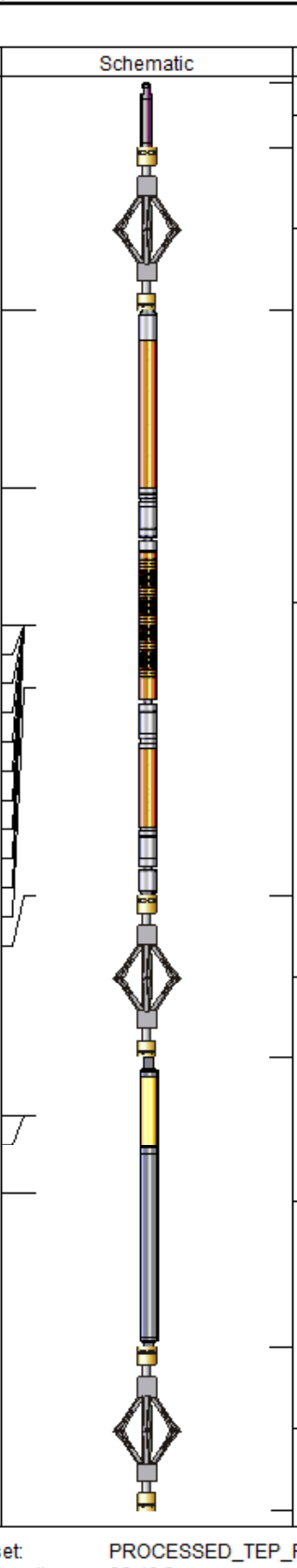
-150 (ft/min) 150	0 (mV) 20			0 150
Line Tension	3' Travel Time			Maximum Amplitude
0 (lb) 2000	300 (usec) 200			0 150
Temperature				
0 (degF) 20				



Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			Titan_Electric_Cable_Heads-Titan_1-1 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
HeadVolt	18.84					
Temp	16.05					
WVFS8	13.88		Probe_RADII-C-P_RBT_2750 (FW1305- Probe 2-3/4" Sector Cement Bond Tool with Temperature Probe	09.19	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 (FW1 Probe 2-3/4" Digital CCL / Gamma Ray Combined	214.541)	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 443-5_RBL_10-28-17.db: field/well/run1/Main
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 443-5_rbl_10-28-17\processed_tep_federal gm 443-5_rbl_10-2
Dataset Pathname Main.1
Dataset Creation Mon Oct 30 16:36:17 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'	-0.002	0.911	0.800	81.196	88.090	0.989
CAL	0.816	0.829				
5'	-0.028	0.915	0.800	81.196	85.269	3.203
SUM						
S1	-0.009	0.931	0.000	100.000	106.370	0.965
S2	-0.005	0.968	0.000	100.000	102.762	0.499
S3	-0.006	0.971	0.000	100.000	102.332	0.589
S4	-0.006	0.959	0.000	100.000	103.662	0.607
S5	-0.008	0.973	0.000	100.000	101.971	0.770
S6	-0.006	0.954	0.000	100.000	104.143	0.672
S7	-0.007	0.921	0.000	100.000	107.778	0.760
S8	-0.004	0.888	0.000	100.000	112.109	0.438

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
State	Colorado