RELIANCE OILFIELD SERVICES

Radial Cement Bond Gamma Ray Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal GM 413-4
Field	Grand Valley
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC
Well Federal GM 413-4
Field Grand Valley
County Garfield State Colorado
Location: API # : 05-045-23503
SEC 5 TWP 7S RGE 96W
Other Services: --

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

Date	28-OCT-2017
Run Number	One
Depth Driller	7167 FT
Depth Logger	7116 FT
Bottom Logged Interval	7111 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Fresh Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	210°F
Estimated Cement Top	See Log
Time Well Ready	ROA
Time Logger on Bottom	11:58
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	1079 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	7121 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
Ground Level 1 FT below top of cut pipe
Marker Joint logged at 4577 FT- 4599 FT
Log ran from 7116 FT to Surface
Recorded 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 gm 413-4_rbl_10-28-17\processed_tep_federal gm 413-4_rbl_10-28-17.db
Dataset Pathname	Main
Presentation Format	ros_rbt004_tep
Dataset Creation	Sat Oct 28 11:57:41 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				

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

RELIANCE
OILFIELD SERVICES

Repeat Pass

Recorded with 0 PSI Surface Induced Pressure

Database File	tep_federal gm 413-4_rbl_10-28-17\processed_tep_federal gm 413-4_rbl_10-28-17.db
Dataset Pathname	repeat
Presentation Format	ros_rbt004_tep
Dataset Creation	Sat Oct 28 11:54:26 2017
Charted by	Depth in Feet scaled 1:240

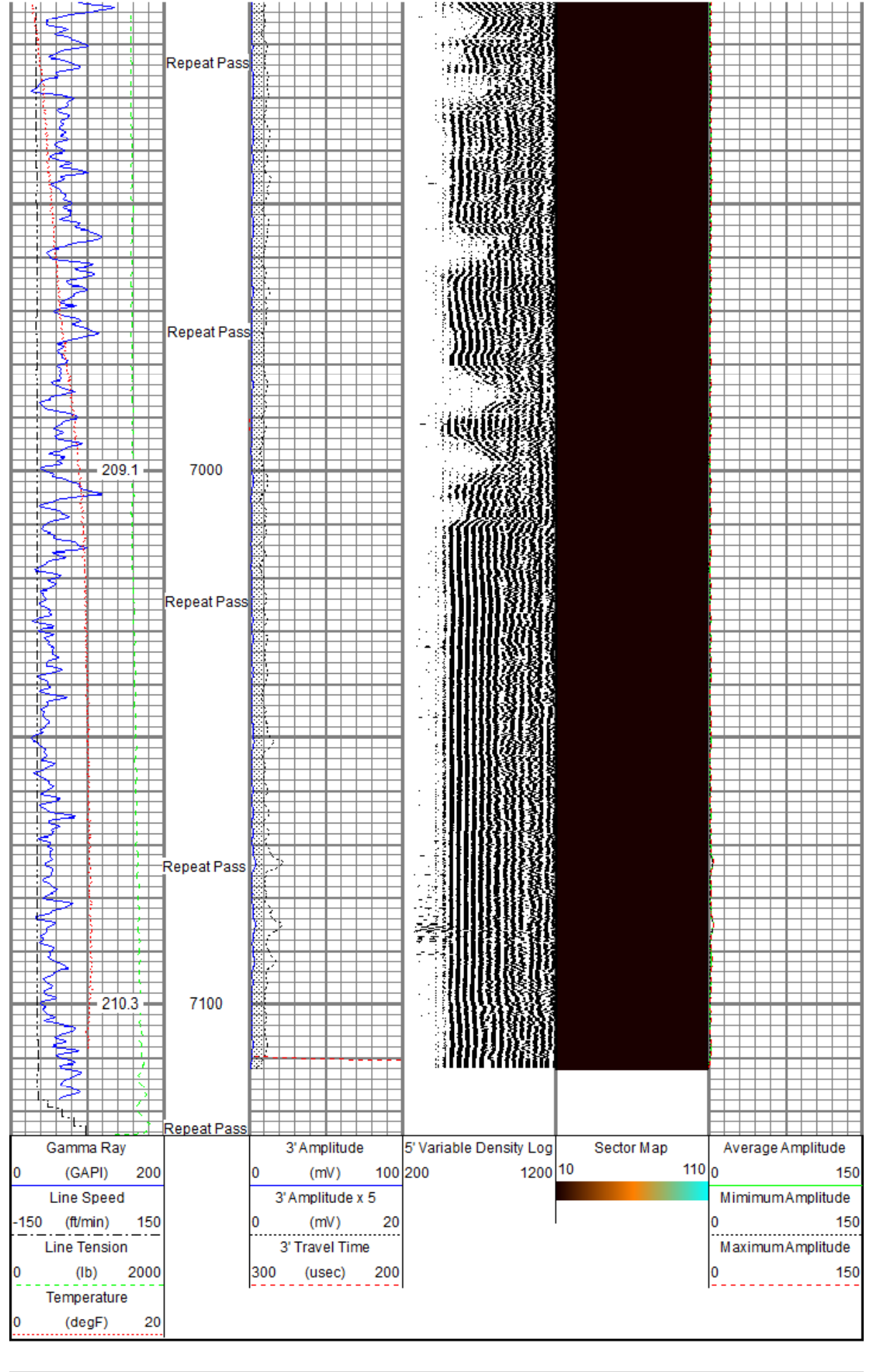
Gamma Ray
0 (GAPI) 200
Line Speed
-150 (ft/min) 150
Line Tension
0 (lb) 2000
Temperature
0 (degF) 20

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



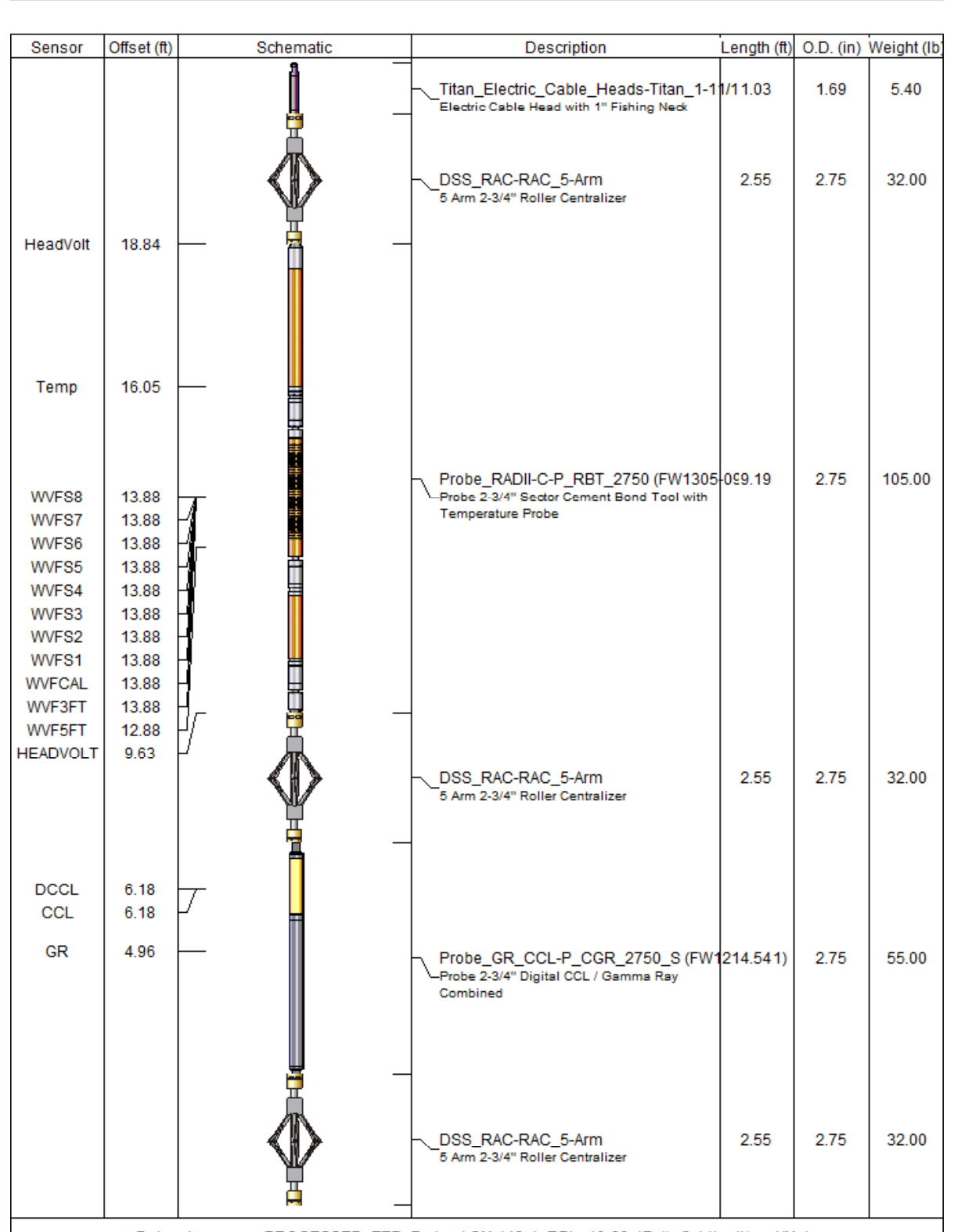
Gamma Ray
0 (GAPI) 200
Line Speed
-150 (ft/min) 150
Line Tension
0 (lb) 2000
Temperature
0 (degF) 20

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



Sensor	Offset (ft)	Description	Length (ft)	O.D. (in)	Weight (lb)
		Titan_Electric_Cable_Heads-Titan_1-1 Electric Cable Head with 1" Fishing Neck	1/11.03	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 (FW1305-0 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 (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 413-4_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 413-4_RBL_10-28-17\PROCESSED_TEP_Federal GM 413-
Dataset Pathname	Main
Dataset Creation	Sat Oct 28 11:57:41 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 Sat Oct 28 09:59:20 2017:

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.002	0.852	0.800	81.196	94.248	0.942
CAL	0.816	0.829				
5'	-0.000	0.697	0.800	81.196	115.280	0.830
SUM						
S1	-0.008	0.871	0.000	100.000	113.765	0.917
S2	-0.005	0.907	0.000	100.000	109.671	0.530
S3	-0.005	0.913	0.000	100.000	108.872	0.554
S4	-0.005	0.896	0.000	100.000	110.919	0.566
S5	-0.005	0.867	0.000	100.000	114.646	0.627
S6	-0.005	0.840	0.000	100.000	118.317	0.611
S7	-0.005	0.824	0.000	100.000	120.597	0.658
S8	-0.005	0.823	0.000	100.000	120.685	0.631

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

RELIANCE
OILFIELD SERVICES

Company	TEP Rocky Mountain LLC
Well	Federal GM 413-4
Field	Grand Valley
County	Garfield
State	Colorado