RELIANCE
OILFIELD SERVICES

Radial Cement Bond
Gamma Ray
Casing Collar Log

Company TEP Rocky Mountain LLC
Well Federal SG 31-21
Field Grand Valley
County Garfield
State Colorado

Company	TEP Rocky Mountain LLC		
Well	Federal SG 31-21		
Field	Grand Valley		
County	Garfield	State	Colorado
Location:	API # : 05-045-24125	Other Services	PN
	SEC 22 TWP 7S RGE 96W		
Permanent Datum	Ground Level	Elevation 6090.8'	Elevation
Log Measured From	Kelly Bushing	24 FT	K.B. 6114.8'
Drilling Measured From	Kelly Bushing		D.F. ---
			G.L. 6090.8'

Date	29-MAR-2019
Run Number	One
Depth Driller	6994 FT
Depth Logger	6926 FT
Bottom Logged Interval	6912 FT
Top Log Interval	Surface
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	175°F
Estimated Cement Top	See Log
Time Well Ready	ROA
Time Logger on Bottom	08:30
Equipment Number	HD-0359
Location	Grand Junction, CO
Recorded By	A. Ellsworth
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	1006 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	6958 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
Marker Joints recorded from 3933 - 3955 FT and 3955 FT - 3976 FT
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\tep_federal sg 31-21_rbl_03-29-19\processed_tep_federal sg 31-21_rbl_03-29-19.db
Dataset Pathname	main.1
Presentation Format	ros_rbt004_tep
Dataset Creation	Sat Mar 30 12:40:59 2019
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			MimimumAmplitude
-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					
10 CCL 0					

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				

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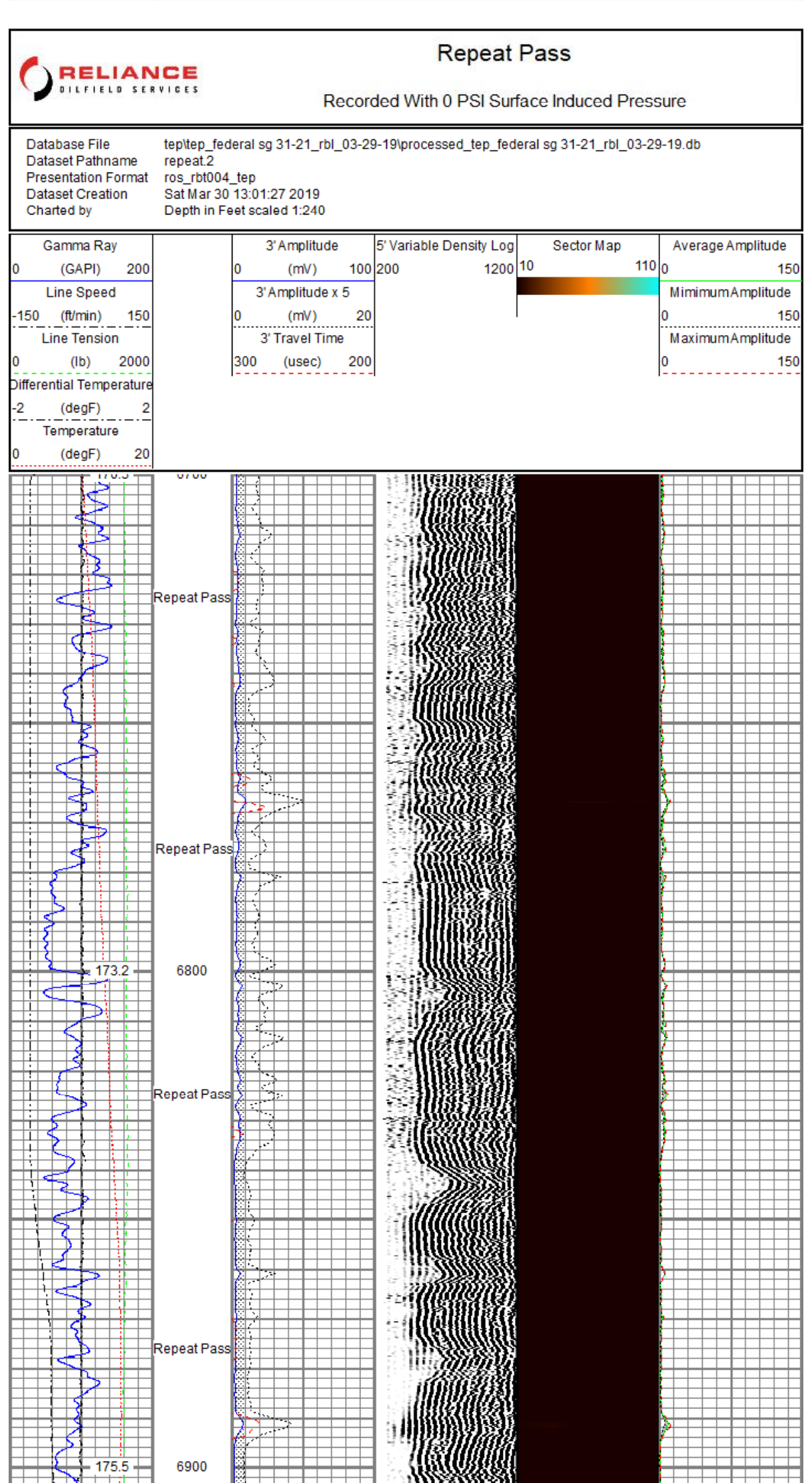
Repeat Pass

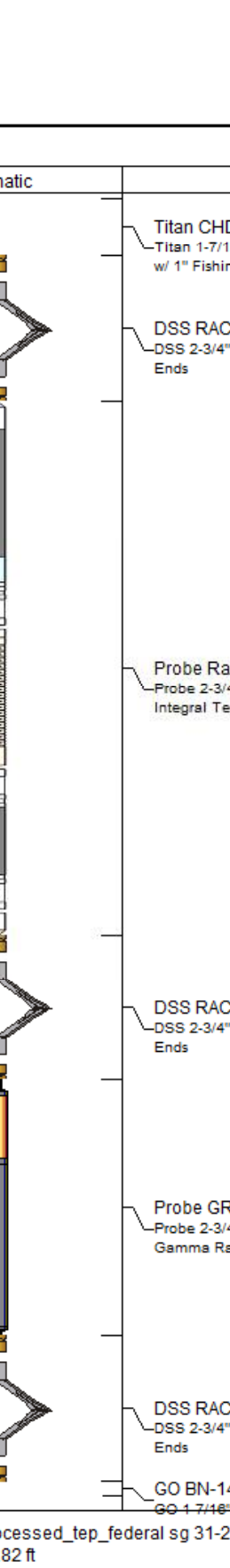
Recorded With 0 PSI Surface Induced Pressure

Database File tep\tep_federal sg 31-21_rbl_03-29-19\processed_tep_federal sg 31-21_rbl_03-29-19.db
Dataset Pathname repeat.2
Presentation Format ros_rbt004_tep
Dataset Creation Sat Mar 30 13:01:27 2019
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
Differential Temperature				
-2 (degF) 2				
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
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 (FW1307-063) 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: processed_tep_federal sg 31-21_rbl_03-29-19.db: field/well/run1/main.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\tep_federal sg 31-21_rbl_03-29-19\processed_tep_federal sg 31-21_rbl_03
Dataset Pathname main.1
Dataset Creation Sat Mar 30 12:40:59 2019

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:	FW1307-063	
Tool Model:	2750 RBT	
Calibration Casing Diameter:	4.500	in
Calibration Depth:	199.964	ft

Master Calibration, performed (Derived):

	Raw (v)		Calibrated (mv)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
3'	-0.002	0.942	0.800	81.196	85.165	0.944
CAL	-0.006	0.758				

SUM						
S1	-0.006	0.926	0.000	100.000	107.314	0.663
S2	-0.004	0.929	0.000	100.000	107.185	0.385
S3	-0.003	0.971	0.000	100.000	102.599	0.353
S4	-0.004	1.029	0.000	100.000	96.785	0.374
S5	-0.005	1.038	0.000	100.000	95.886	0.449
S6	-0.001	1.005	0.000	100.000	99.354	0.124
S7	-0.004	1.011	0.000	100.000	98.510	0.393
S8	-0.002	0.956	0.000	100.000	104.403	0.195

Internal Reference Calibration, performed (Not Performed):

	Raw (v)		Calibrated (v)		Results	
	Zero	Cal	Zero	Cal	Gain	Offset
CAL	0.000	0.000	-0.006	0.758	1.000	0.000

Air Zero Calibration, performed Fri Mar 29 07:31:33 2019:

	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: FW1307-063
Tool Model: 2750 RBT
Performed: Sun Nov 12 13:45:43 2017

	Reference	Reading
Low Reference:	100.00 degF	113.84 degF
High Reference:	350.00 degF	420.89 degF

Gain: 0.81
Offset: 7.31
Delta Spacing 1

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Field	Grand Valley
County	Garfield
State	Colorado