RELIANCE OILFIELD SERVICES

Pulsed Neutron Gamma Ray Casing Collar Log

Company	TEP Rocky Mountain LLC
Well	Federal RWF 524-1
Field	Rulison
County	Garfield
State	Colorado

Company TEP Rocky Mountain LLC
Well Federal RWF 524-1
Field Rulison
County Garfield State Colorado
Location: API # : 05-045-24278
SEC 12 TWP 6S RGE 94W
Other Services RBL

Permanent Datum	Ground Level	Elevation 5466.8'	Elevation K.B. 5490.8' D.F. --- G.L. 5466.8'
Log Measured From	Kelly Bushing	24 FT	
Drilling Measured From	Kelly Bushing		

Date	06-MAR-2020
Run Number	One
Depth Driller	9391 FT
Depth Logger	9341 FT
Bottom Logged Interval	9341 FT
Top Log Interval	4938 FT
Open Hole Size	8.750"
Type Fluid	Water
Density / Viscosity	8.34 lb/gal
Max. Recorded Temp.	---
Estimated Cement Top	---
Time Well Ready	---
Time Logger on Bottom	---
Equipment Number	HD-0359
Location	Grand Junction, CO
Recorded By	J. Donnelly
Witnessed By	---

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	36	J-55	Surface	1042 FT
Intermediate #1	4 1/2	11.6	P-110	Surface	9345 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 Reliance Bond Log dated 06-MAR-2020
Log ran from 9341 FT to 4938 FT
Pulsed Neutron Data logged with Hunter RAS tool

Thank you for choosing Reliance Oilfield Services, LLC!!

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Main Pass

Database File	tep\federal rwf 524-1\tep_federal rwf 524-1_pn_03-06-20.db
Dataset Pathname	run2SHIFTED/merge1
Presentation Format	ros_pdn_hunter
Dataset Creation	Wed Mar 11 16:16:29 2020
Charted by	Depth in Feet scaled 1:240

0 GR (GAPI) 150
PN Casing Collar Locator
-100 Line Speed (ft/min) 100
0 NIRS (cps) 400000
0 BKGN (cps) 4000
0 BKGF (cps) 2000

4 RNF2 0
60 SIGMA (cu) 0
4.5 RNFI -1
1 PN Porosity (Sandstone) 0
FIS2
0 (cps) 45000
NIS2
0 (cps 100000

0	GR (GAPI)	150	4	RNF2	0	
	PN Casing Collar Locator		60	SIGMA (cu)	0	
-100	Line Speed (ft/min)	100	4.5	RNFI	-1	
0	NIRS (cps)	400000	1	PN Porosity (Sandstone)	0	FIS2 0 (cps) 45000
0	BKGN (cps)	4000				NIS2 0 (cps100000
0	BKGF (cps)	2000				

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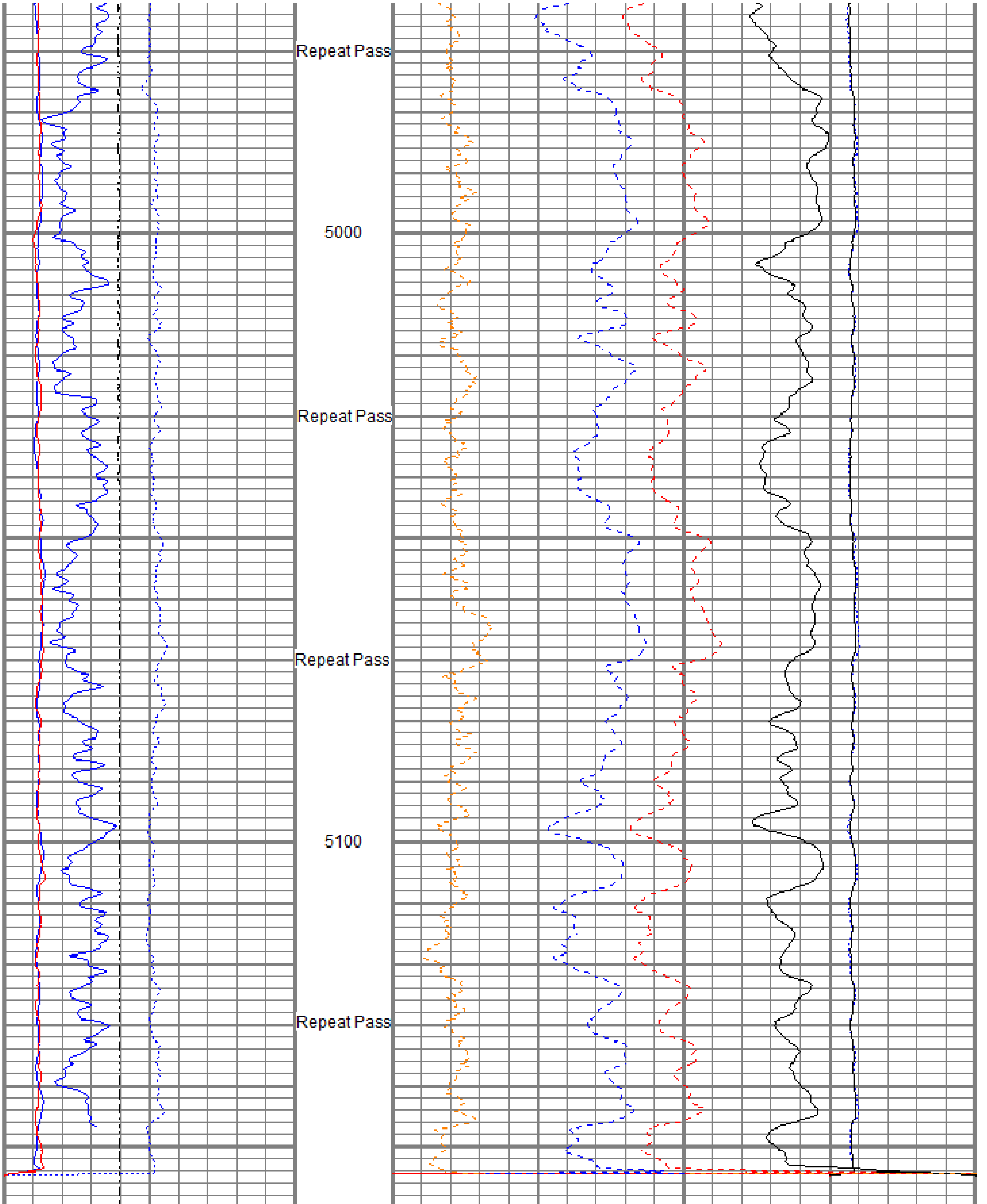
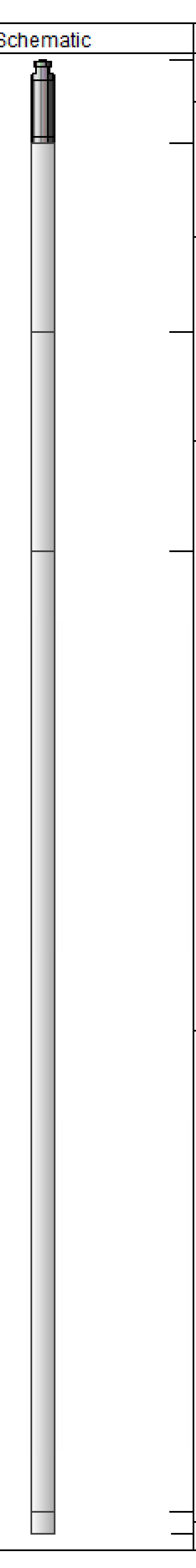
Repeat Pass

Database File	tep\federal rwf 524-1\tep_federal rwf 524-1_pn_03-06-20.db
Dataset Pathname	run2/Repeat.2
Presentation Format	ros_pdn_hunter
Dataset Creation	Sat Mar 07 06:59:17 2020
Charted by	Depth in Feet scaled 1:240

0	GR (GAPI)	150	4	RNF2	0	
-100	Line Speed (ft/min)	100	60	SIGMA (cu)	0	
0	NIRS (cps)	400000	4.5	RNFI	-1	
0	BKGN (cps)	4000		PN Porosity (Sandstone)		FIS2 0 (cps) 45000
0	BKGF (cps)	2000	1	(Porosity Decimal Fraction)	0	NIS2 0 (cps100000



0	GR (GAPI)	150	4	RNF2	0	
-100	Line Speed (ft/min)	100	60	SIGMA (cu)	0	
0	NIRS (cps)	400000	4.5	RNFI	-1	
0	BKGN (cps)	4000		PN Porosity (Sandstone)		FIS2 0 (cps) 45000
0	BKGF (cps)	2000	1	(Porosity Decimal Fraction)	0	NIS2 0 (cps100000

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb
			Titan CHD-16875 GO Titan 1-11/16" Assembled Electric Cable Head w/ 1" Fishing Neck	1.03	1.69	5.40
TCUTEMP TCUVOLT	14.69 14.69		HWS_TCU-002 (001705) HWS Telemetry Control Unit (TCU002)	2.30	1.69	10.87
GCL_CCL GCL_GR	13.97 12.50		HWS_GCL-001 (001681) HWS Gamma Ray Collar Locator (1.6875")	2.69	1.69	13.40
Long Far Near Anci	6.25 6.25 6.25 6.25		HWS_RAS-RAS002 (003040) Hunter Well Science Pulsed Neutron Tool	11.75	1.69	55.82
LOCTIM UTCTIM	0.00 0.00		HWS_TBN-001 (001724) HWS Terminator Bull Nose (1.6875")	0.25	1.69	0.99

Dataset:	TEP_Federal RWF 524-1_PN_03-06-20.db: field/well/run2/Main.2
Total length:	18.02 ft
Total weight:	86.48 lb
O.D.:	1.69 in

Calibration Report

Database File	C:\ProgramData\Warrior\Data\TEP\Federal RWF 524-1\TEP_Federal RWF 524-1_PN_03-06-20.db
Dataset Pathname	run2/Main.2
Dataset Creation	Sat Mar 07 07:08:53 2020

RAS Calibration Report

Calibration Date: Sat Sep 16 14:23 2019

Meas #: 003040

Water Tank

Description	Curve	Standard	Mean	Dev
Sigma Near	SIGN	23.1	24.1	0.18
Sigma Far	SIGF	22.8	23.5	0.20
Ratio Near-Long Capture	RNL2	5.79	7.46	0.05
Ratio Near-Long Burst	RNLB	6.49	7.82	0.04
Ratio Near-Far Capture	RNF2	1.85	2.03	0.01
Ratio Near-Far Burst	RNFB	2.03	2.19	0.01
Spectral Hydrogen Index	HIS2	12.84	13.86	0.22
Carbon-Oxygen Ratio	CORS	1.34	1.85	0.07
Ratio Burst-Capture Near	RNBC	1.46	1.68	0.01
Ratio Burst-Capture Far	RFBC	1.50	1.61	0.01

Hydrocarbon Tank

Description	Curve	Standard	Mean	Dev
Sigma Near	SIGN	25.7	27.8	0.27
Sigma Far	SIGF	25.1	26.1	0.23
Ratio Near-Long Capture	RNL2	1.78	3.38	0.02
Ratio Near-Long Burst	RNLB	2.57	5.01	0.02
Ratio Near-Far Capture	RNF2	0.98	1.32	0.01
Ratio Near-Far Burst	RNFB	1.30	1.68	0.01
Spectral Hydrogen Index	HIS2	16.68	19.26	0.36
Carbon-Oxygen Ratio	CORS	1.51	2.04	0.06
Ratio Burst-Capture Near	RNBC	2.23	2.37	0.02
Ratio Burst-Capture Far	RFBC	2.09	2.09	0.02

Gamma Ray Calibration Report

Serial Number:	001681	
Tool Model:	001	
Performed:	(Not Performed)	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	
Calibrator Reading:	1.0	
Sensitivity:	1.0000	GAPI/

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