Schlumberger

Company: CRESTONE PEAK RESOURCES OPERATING LLC

Well: Cosslett 1B-22H-B168

Field: WATTENBERG

County: WELD State: COLORADO

CASING BOND LOG

CBL/VDL/GR/CCL

County: WELD
Field: WATTENBERG
Location: NWNE 22 1N68W 6 PM
Well: Cosslett 1B-22H-B168
Company: CRESTONE PEAK RESOURCES OPERATING LLC

Location:				
NWNE 22 1N68W 6 PM 925' FNL & 2240' FEL		Elev.:	K.B.	5196.00 ft
			G.L.	5173.00 ft
			D.F.	5196.00 ft
Permanent Datum:	Ground Level	Elev.:		5173.00 f
Log Measured From:	Kelly Bushing	23.00 ft		above Perm.Datum
Drilling Measured From:	Kelly Bushing			

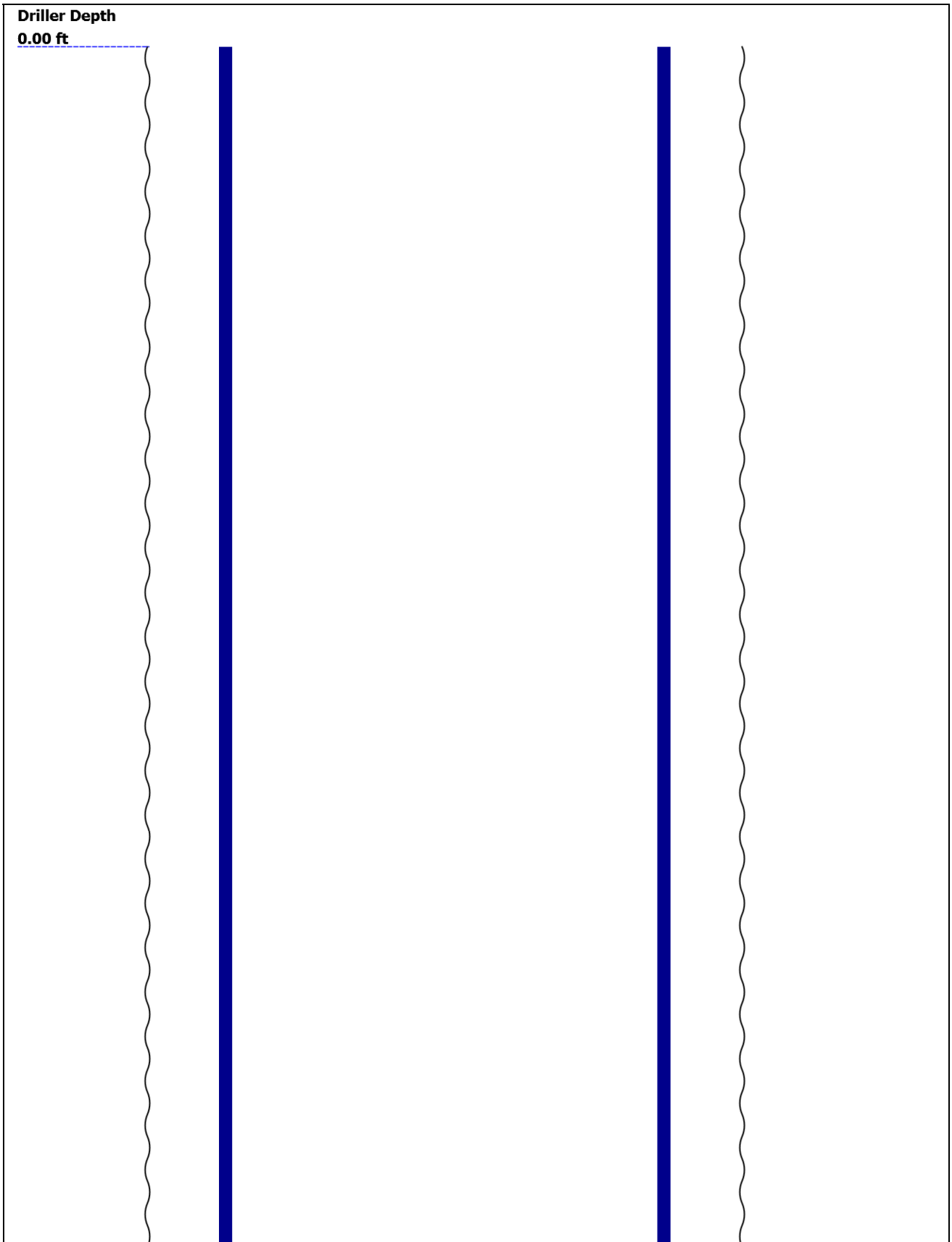
API Serial No.	Section:	Township:	Range:
05-123-47670	22	1N	68W

Logging Date	24-Oct-2018		
Run Number	ONE		
Depth Driller	535.00 ft		
Schlumberger Depth	535.00 ft		
Bottom Log Interval	512.00 ft		
Top Log Interval	30.00 ft		
Casing Fluid Type	Water		
Salinity			
Density	8.4 lbm/gal		
Fluid Level	8.00 ft		
BIT/CASING/TUBING STRING			
Bit Size	17.50 in		
From	0.00 ft		
To	535.00 ft		
Casing/Tubing Size	13.375 in		
Weight	54.5 lbm/ft		
Grade	J55		
From	0.00 ft		
To	514.00 ft		
Max Recorded Temperatures			
Logger on Bottom Time			
Unit Number Location:	2377	Fort Morgan	
Recorded By	CSTILES		
Witnessed By			

Disclaimer

Contents

Well Sketch



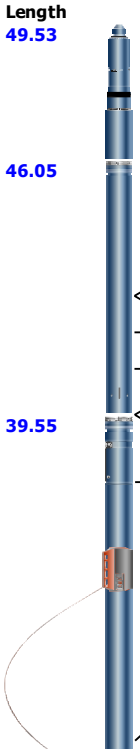
Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	17.5					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	535					
Bottom Logger (ft)	535					
Casing						
Size (in)	13.375					
Weight (lbm/ft)	54.5					
Inner Diameter (in)	12.615					
Grade	J55					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	514					
Bottom Logger (ft)	514					

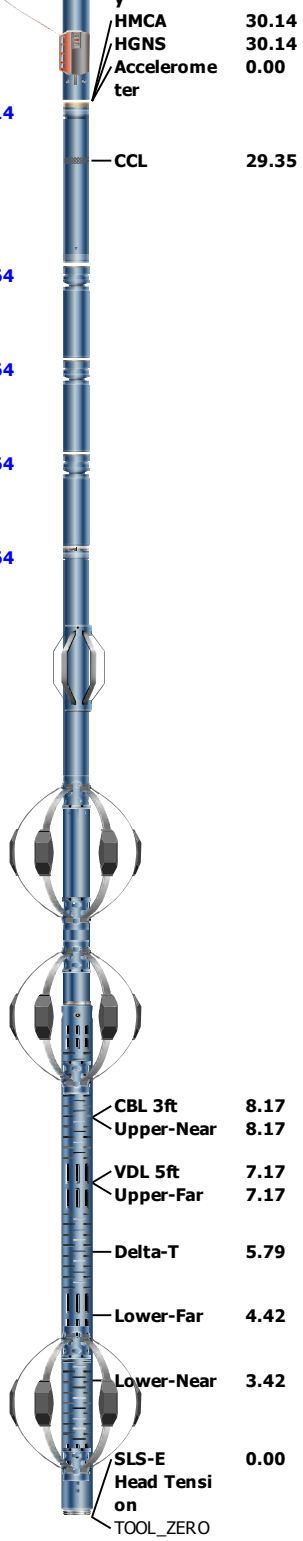
Remarks and Equipment Summary

ONE: Toolstring

Equip name	Length	MP name	Offset
LEH-QT	**49.53**		
LEH-QT			
EDTC-B	**46.05**		
EDTH-B:9373			
EDTG-A			
EDTC-B			
		CTEM	**42.55**
		ACCZ	**0.00**
		HV	**0.00**
		Gamma Ray	**40.68**
		TelStatus	**39.55**
HGNS-H	**39.55**	**Temperatur e**	**39.52**
HGNH			
NPV-N			
NSR-F			
HGNS-H		**GR**	**38.81**
HACCZ-H			
HMCA-H			
		CNL Porosit y	**32.47**



ONE: Remarks



Lengths are in ft
Maximum Outer Diameter = 6.250 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

	ONE		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		

Wheel Correction 2	0		

Tension Device

Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		

Logging Cable

Type	7-46PI-XS		
Serial Number			
Length	20000.00 ft		
Conveyance Type	Wireline		
Rig Type			

ONE:Depth Control Parameters		Depth Control Remarks
Log Sequence	First Log In the Well	
Rig Up Length At Surface		
Rig Up Length At Bottom		
Rig Up Length Correction		
Stretch Correction		
Tool Zero Check At Surface		

ONE

Software Version

Acquisition System	Version
Maxwell 2018 SP2	8.2.104493.3100

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[5]:Up	Up	33.46 ft	524.32 ft	24-Oct-2018 3:03:21 PM	24-Oct-2018 3:16:25 PM	ON	0.00 ft	No

All depths are referenced to toolstring zero

Log

Company:CRESTONE PEAK RESOURCES OPERATING LLC Well:Cosslett 1B-22H-B168

ONE: Log[5]:Up:S004

Description: CBL_Fluid_Compensated Format: Log (Sonic Fluid-Compensated CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Oct-2018 02:50:10

BIEP - Bond Index Event Pips DSLT-H

TIME_1900 - Time Marked every 60.00 (s)

Casing Collar Locator Amplitude (CCL) CAL-YA

-9 1

Gamma Ray (ECGR_EDTC) EDTC-B

0 gAPI 150

Borehole Diameter (GHD) RT

6 in 16

Transit Time for CBL (TT) DSLT-H

450 us 350

Transit Time 1 (TT1) DSLT-H

CBL Amplitude (CBL) DSLT-H

0 mV 100

CBL Amplitude (Fluid Compensated) (CBLF) DSLT-H

0 mV 100

Stuck Tool Indicator,

Transit Time 1 (TT1) DSLT-H
1200 us 200

Transit Time 2 (TT2) DSLT-H
1200 us 200

Transit Time (Sliding Gate) (TTSL) DSLT-H
450 us 350

Total (STT)
0 ft 50

Cable Drag

Tool_Tot. Drag

CBL Amplitude (CBL) DSLT-H
0 mV 100

Good Bond (GOBO)
0 mV 10

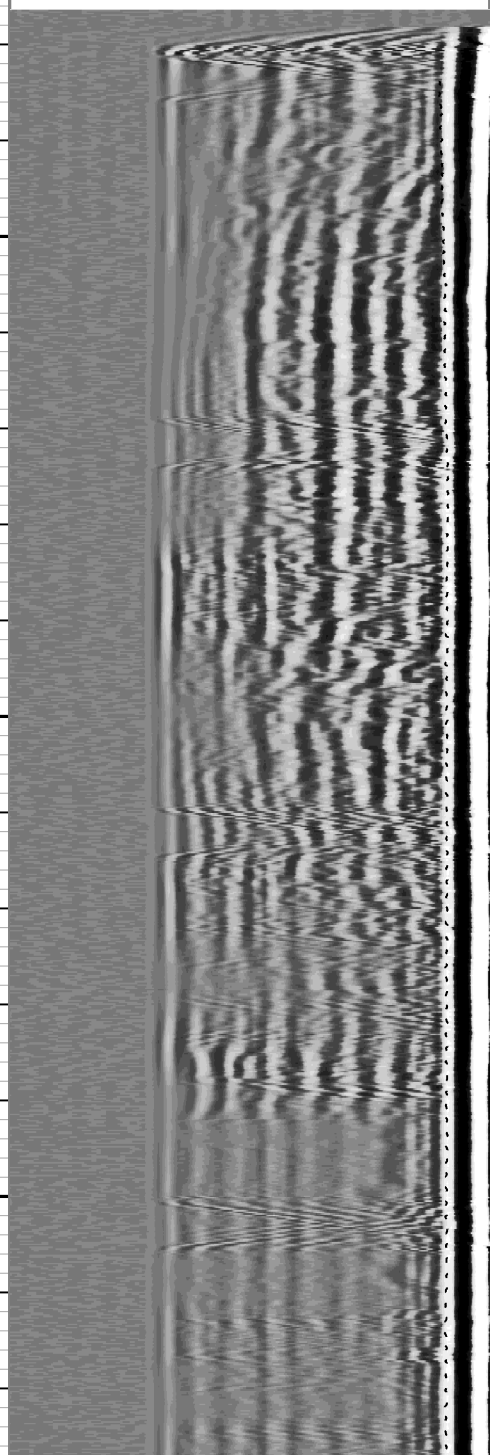
GoodBond from CBL to GOBO

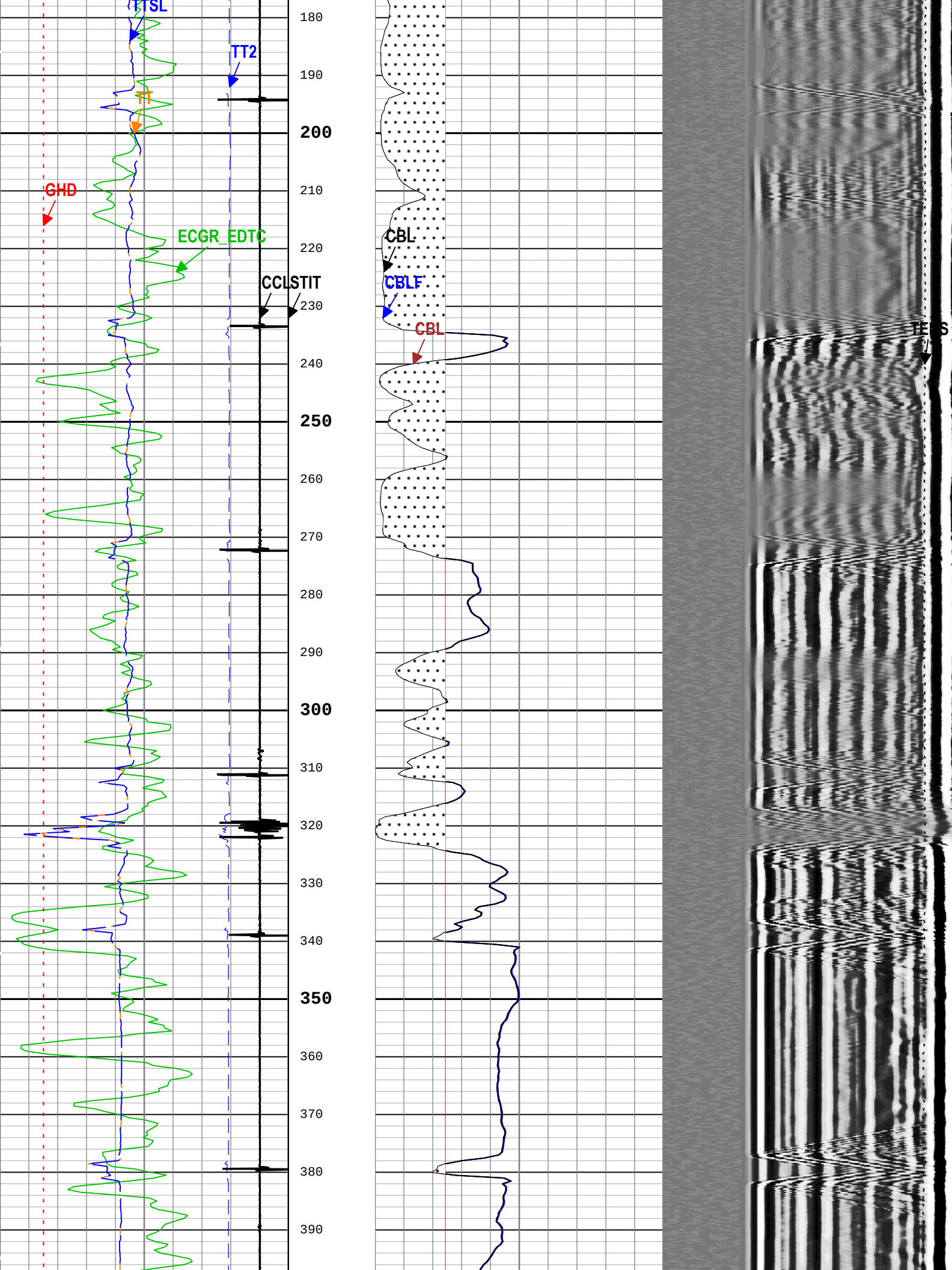
Min Amplitude Max

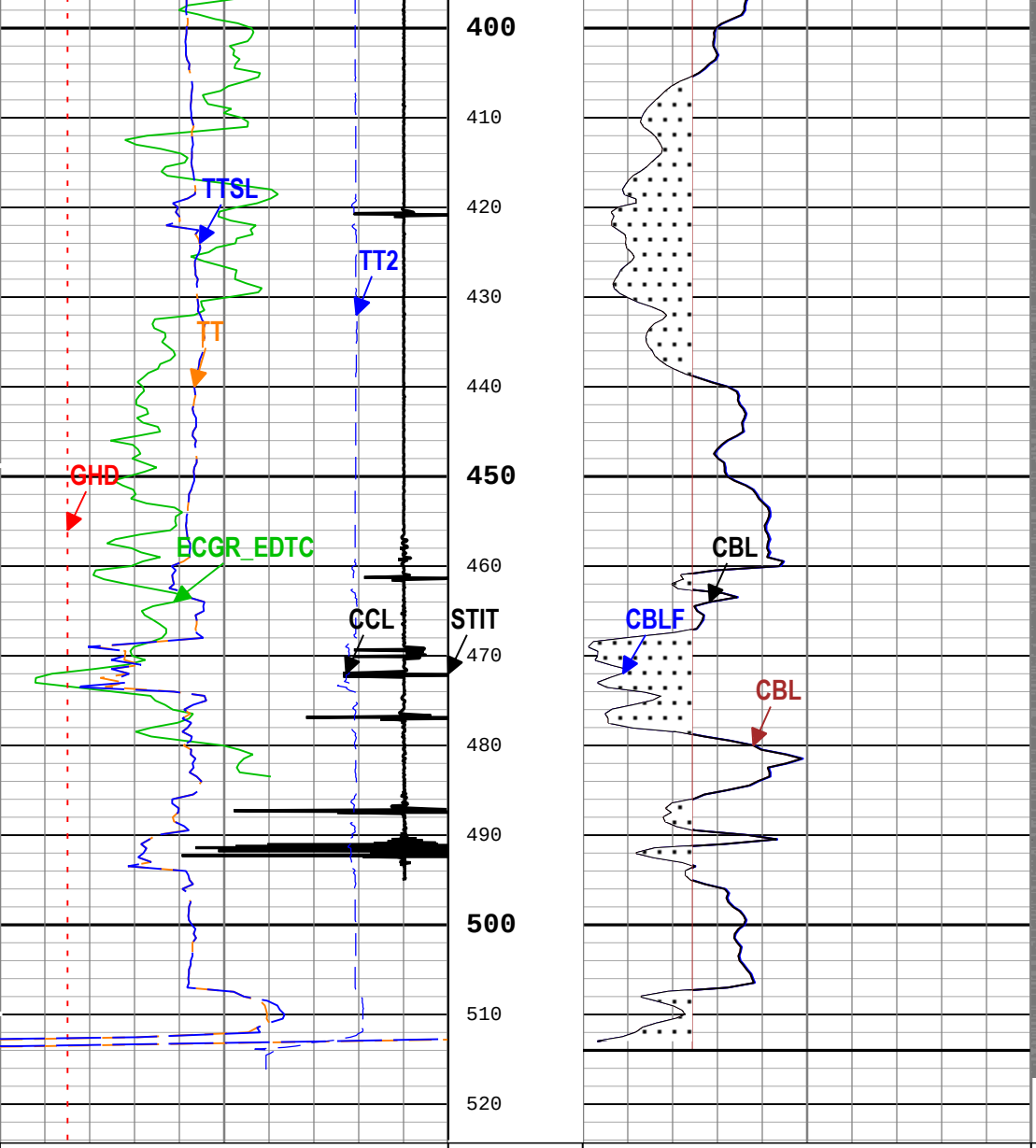
Variable Density Log (VDL) DSLT-H
200 us 1200

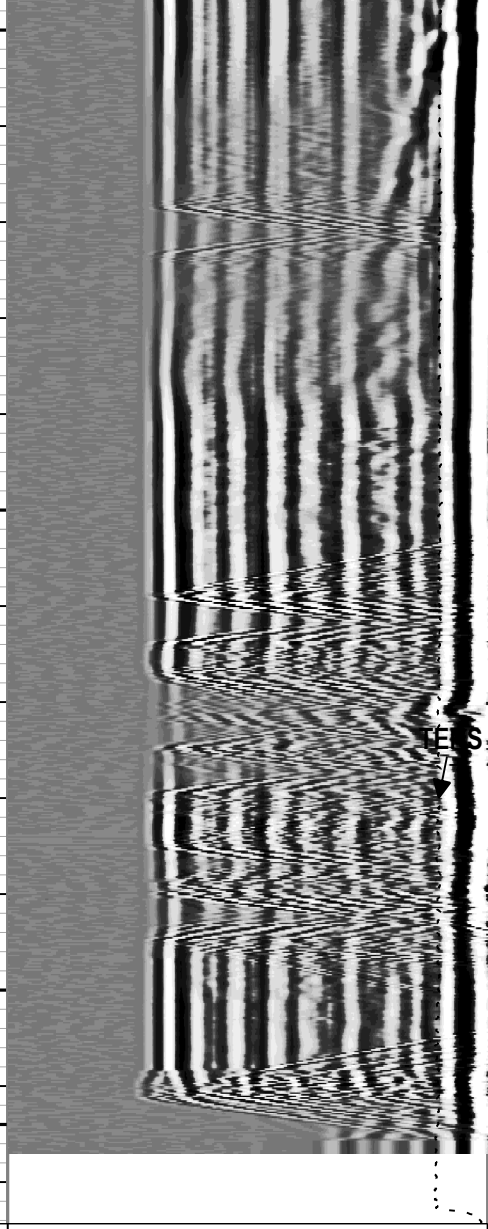
Cable Tension (TENS)
10000 lbf 0

-10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170




TTSL
TT2
TT
GHD
ECGR_EDTC
CCLSTIT
CBL
CBLF
CBL
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
360
370
380
390





Casing Collar Locator Amplitude (CCL) CAL-YA	Stuck Tool Indicator, Total (STIT)	CBL Amplitude (CBL) DSLT-H
-9 — 1	0 ft 50	0 mV 100
Gamma Ray (ECGR_EDTC) EDTC-B	Cable Drag	CBL Amplitude (Fluid Compensated) (CBLF) DSLT-H
0 gAPI 150		0 mV 100
Borehole Diameter (GHD) RT	Tool_Tot. Drag	CBL Amplitude (CBL) DSLT-H
6 in 16		0 mV 100
Transit Time for CBL (TT) DSLT-H		Good Bond (GOBO)
450 us 350		0 mV 10
Transit Time 1 (TT1) DSLT-H		GoodBond from CBL to GOBO
1200 us 200		
Transit Time 2 (TT2) DSLT-H		
1200 us 200		
Transit Time (Sliding Gate) (TTSL) DSLT-H		
450 us 350		

Min Amplitude Max	
Variable Density Log (VDL) DSLT-H	
200 us 1200	
Cable Tension (TENS)	
10000 lbf 0	

TIME_1900 - Time Marked every 60.00 (s)

BIEP - Bond Index Event Pips DSLT-H

Description: CBL_Fluid_Compensated Format: Log (Sonic Fluid-Compensated CBL with VDL) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 25-Oct-2018 02:50:10

Channel Processing Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
BARI(ISSBAR)	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Cased	
BS	Bit Size	WLSESSION	17.5	in
CBLG	CBL Gate Width	DSLT-H	69	us
CBLO	Casing Bottom (Logger)	WLSESSION	514	ft
CBRA	CBL LQC Reference Amplitude in Free Pipe	DSLT-H	Depth Zoned	mV
CCL_MULTIPLIER	Casing Collar Locator Multiplier	CAL-YA	1	
CDEN	Cement Density	EDTC-B	2	g/cm3
DETE	Delta-T Detection	DSLT-H	E1	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	BS(RT)	
GOBO_CURR	Good Bond in Arbitrary Cement	DSLT-H	Depth Zoned	mV
MAHTR	Manual High Threshold Reference for first arrival detection	DSLT-H	120	
MATT_CURR	Maximum Attenuation in Arbitrary Cement	DSLT-H	Depth Zoned	dB/ft
MCI	Minimum Cemented Interval for Isolation	DSLT-H	Depth Zoned	ft
MNHTR	Minimum High Threshold Reference for first arrival detection	DSLT-H	64	
MSA	Minimum Sonic Amplitude	DSLT-H	Depth Zoned	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	DSLT-H	Depth Zoned	mV
NMSG	Near Minimum Sliding Gate	DSLT-H	373	us
SGAD	Sliding Gate Status	DSLT-H	Off	
SGDT	Sliding Gate Delta-T	DSLT-H	57	us/ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
CBRA	43	0	514
CBRA	0	514	524.33
GOBO_CURR	2.43	0	514
GOBO_CURR	0	514	524.33
MATT_CURR	11.3	0	514
MATT_CURR	0	514	524.33
MCI	21.68	0	514
MCI	0	514	524.33
MSA	1.19	0	514
MSA	0	514	524.33
MSA_CURR	1.19	0	514
MSA_CURR	0	514	524.33

All depth are actual.

Tool Control Parameters

ONE: Parameters

Parameter	Description	Tool	Value	Unit
MODE	DSLT Acquisition Mode	DSLT-H	CBL	
RATE	DSLT Firing Rate	DSLT-H	15 Hz	
DTFS	DSLT Telemetry Frame Size	DSLT-H	536	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
SGAI	Selectable Acquisition Gain	DSLT-H	x1	

Calibration Report

DSLT-H (Digitizing Sonic Logging Tool - H) Calibration - Run ONE

Primary Equipment :

Sonic Logging Sonde E supports 3'-5'BHC DT and CBL/VDL SLS-E 1563

CBL Normalization - CBL Accumulations

Master (Measured): 09:56:52 29-Mar-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Upper Far Amplitude		Master	4200.0	3200.0	3230.1	
Upper Near Raw Amplitude	mV	Master	33.000	27.000	33.807	43.000
Lower Far Amplitude		Master	4200.0	3200.0	4360.3	
Lower Near Raw Amplitude	mV	Master	46.000	27.000	42.780	68.000

CBL Normalization - CBL/VDL Coefficients

Master (Measured): 09:56:52 29-Mar-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
CBL Correction Factor for UT		Master	3.500	2.700	3.431	4.300
CBL Correction Factor for LT		Master	2.500	1.700	2.712	4.300
VDL Ratio between UT and LT for CBLB Mode		Master	1.000		1.350	

CBL Free Pipe Adjustment - Free Pipe Measurement

Before (Measured): 14:57:29 24-Oct-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
CBL Amplitude	mV	Before	60.00	15.00	51.53	174.00
CBL Reference Amplitude (CBRA)	mV	Before			43.00	
Measurement Depth	ft	Before			360.12	

CBL Free Pipe Adjustment - CBL Amplitude Coefficient

Before (Measured): 14:57:29 24-Oct-2018

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
CBL Adjustment Factor		Before	1.000	0.200	0.834	5.000
Depth of Before Calibration	ft	Before			360.12	

Field:	WATTENBERG
County:	WELD
State:	COLORADO

CASING BOND LOG

CBL/VDL/GR/CCL