

**Resistivity /
Array Induction Tool
Final Composite 1''& 2''**

Company: PB ENERGY STORAGE SERVICES, INC

Well: DCP LINAM RANCH AGI #2

Field: AGI; BONE SPRING-WOLFCAMP

County: LEA State: NEW MEXICO

Resistivity

Array Induction Tool

Final Composite 1" & 2"

LEA
AGI; BONE SPRING-WOLFCAMP
1600' FSL & 1750' FWL
DCP LINAM RANCH AGI #2
PB ENERGY STORAGE SERVICES, INC

Location:		Elev.:	
1600' FSL & 1750' FWL		K.B.	3763.00 ft
		G.L.	3738.00 ft
		D.F.	3762.00 ft
Permanent Datum:	Ground Level	Elev.:	3738.00 f
Log Measured From:	Kelly Bushing	25.00 ft	above Perm.Datum
Drilling Measured From:	Kelly Bushing		
API Serial No.	Section:	Township:	Range:
30-025-42139	30	18S	37E

Logging Date	12-Oct-2014	30-Nov-2014	10-Dec-2014
Run Number	One	Two	Run 3a
Depth Driller	1585.00 ft	8630.00 ft	9234.00 ft
Schlumberger Depth	1526.00 ft	8630.00 ft	9234.00 ft
Bottom Log Interval	1525.00 ft	8622.00 ft	9247.00 ft
Top Log Interval	142.00 ft	3219.50 ft	8594.00 ft
Casing Driller Size @ Depth	30 in @ 145.00 ft	13.375 in @ 3220.00 ft	9.625 in @ 8604.00 ft
Casing Schlumberger	142 ft	3219.5 ft	8594 ft
Bit Size	17.5 in	12.25 in	8.5 in
Type Fluid In Hole	Fresh Water	Salt Brine	Fresh Water
Density	9.3 lbm/gal	8.8 lbm/gal	10.1 lbm/gal
Fluid Loss	12 cm3	0 cm3	0 cm3
PH	9	10	10.5
Source of Sample	Active Tank	Active Tank	Active Tank
RM @ Meas Temp	0.46 ohm.m @ 64.8 degF	9 ohm.m @ 80 degF	1.09 ohm.m @ 62.2 degF
RMF @ Meas Temp	0.38 ohm.m @ 75 degF	7.5 ohm.m @ 80 degF	0.75 ohm.m @ 75 degF
RMC @ Meas Temp	0.31 ohm.m @ 75 degF	0.06 ohm.m @ 75 degF	0.89 ohm.m @ 75 degF
Source RMF	RMC	Pressed	Calculated
RM @ BHT	0.32 @ 98.3 @ 0.29 @ 98.3	6.85 @ 107.3 @ 5.71 @ 107.3	0.52 @ 138 @ 0.42 @ 138
Max Recorded Temperatures	98.3 degF	125 degF	138 degF
Circulation Stopped	11-Oct-2014 20:00:00	30-Nov-2014 02:00:00	09-Dec-2014 08:00:00
Logger on Bottom	12-Oct-2014 09:55:41	30-Nov-2014 13:10:30	10-Dec-2014 04:38:04
Unit Number	Location: 2133	2133	2381
Recorded By	EMIL LUDICK	Tyler Bolton	Matt Clardy/ Phil Lacasse
Witnessed By	TERRY WALLEY	Russell Bentley	Russell Bentley

RUN 1

Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

Contents

1. Header

2. Disclaimer

3. Contents

4. Remarks and Equipment Summary

5. Depth Summary

6. One Main Pass 2"=100'
12. One Main Pass 1"=100'

12.1 Integration Summary

12.2 Composite Summary

12.3 Log (HRLA_1_inch)

6. One Main Pass 5"=100'
 - 6.1 Integration Summary
 - 6.2 Software Version
 - 6.3 Composite Summary
 - 6.4 Log (HRLA_2_inch)
7. One Main Pass 5"=100'
 - 7.1 Integration Summary
 - 7.2 Composite Summary
 - 7.3 Log (HRLA_5_Inch)
 - 7.4 Parameter Listing
8. One Repeat Analysis 5"=100'
 - 8.1 Composite Summary
 - 8.2 Log (HRLA_5_Inch RA)
9. One Repeat Pass 5"=100'
 - 9.1 Integration Summary
 - 9.2 Composite Summary
 - 9.3 Log (HRLA_5_Inch)
10. Calibration Report
11. Tail

Remarks and Equipment Summary

One: Toolstring				One: Remarks
Equip name LEH-QT:3338 LEH-QT:3338	Length 31.93	MP name	Offset	THANK YOU FOR CHOOSING SCHLUMBERGER!
EDTC-B:9071 EDTH-B:8196 EDTG-A:79243 EDTC-B:9071	29.02			LOGGER REQUESTED: 20:00 11-OCT-2014 LOGGER ARRIVAL: RIG READY: RIG: PRECISION #107
		CTEM ACCZ HV Gamma Ray TelStatus	25.52 0.00 0.00 23.65 22.52	CREW: E. LUDICK, C. CRUZ, M. MARTINEZ, A. HUANG, T. ARNZEN
PPC-B:8601 PPC-B:8601	22.52			TOOLS RUN AS PER TOOL SKETCH AND PRESENTATIONS AS PER CLIENT LOGGING PROGRAM.
		PPC-B Calipers	21.37	NO CASING RUN. 30 INCH CONDUCTIVE TUBING WITH AN INNER DIAMETER OF 29.35 INCH SET.
				AIT RUN IN COMPUTE STANDOFF MODE WITH TWO 1.5 INCH STANDOFFS. AIT RUN CENTRALIZED WITH PPC.
				CALIPERS CHECKED IN CASING WITH INNER CASING ID OF 29.35 INCHES.
				MATRIX LIMESTONE DENSITY 2.71 g/cc AND FLUID DENSITY 1.0 g/cc
				PPC USED FOR CALIPER LOG. NO FUTURE CASING DIAMETER. BIT SIZE TO BE EXPANDED TO 26 INCHES.
AIT-M:160 AMIS:160 AMRM:160	16.00			HD1 CALIPER SCALE 10 - 20 INCHES AS PER CLIENT REQUEST
		Temperature Induction Power Supply	7.91 7.91 7.91	
		SP Mud Resistivity Head Tension	0.08 0.00	

TOOL_ZERO Lengths are in ft Maximum Outer Diameter = 9.000 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	63074		
Calibration Date	02-SEP-2014		
Calibrator Serial Number			
Calibration Cable Type	7-46P-XS		
Wheel Correction 1	-2		
Wheel Correction 2	-1		

Tension Device

Type	CMTD-B/A		
Serial Number	3872		
Calibration Date	03-OCT-2014		
Calibrator Serial Number	1019		
Number of Calibration Points	0		

Logging Cable

Type	7-46P-XS		
Serial Number	U713011		
Length	19700.00 ft		
Conveyance Type	Wireline		
Rig Type	LAND		

One:Depth Control Parameters	Depth Control Remarks
------------------------------	-----------------------

Log Sequence	First Log In the Well	IDW USED AS PRIMARY DEPTH CONTROL DEVICE.
Rig Up Length At Surface		Z-CHART USED AS SECONDARY DEPTH CONTROL DEVICE.
Rig Up Length At Bottom		FOLLOWED SCHLUMBERGER FULL DEPTH CONTROL POLICY DATED APRIL 7TH, 2012.
Rig Up Length Correction		ALL LOGS CORRELATED TO DOWN LOG BOTTOM 300 ft.
Stretch Correction	0.75 ft	STRETCH CORRECTION OF 0.75 ft APPLIED BY COMPARING MAIN PASS TO DOWN PASS.
Tool Zero Check At Surface	0.14 ft	

Disclaimer	RUN 2
------------	-------

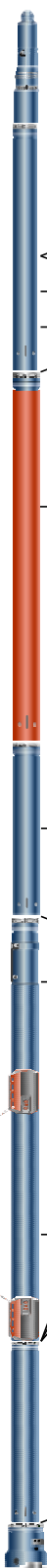
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

Contents	
----------	--

1. Header	12. Two Main Pass 1" = 100'
2. Disclaimer	12.1 Integration Summary
3. Contents	12.2 Composite Summary
4. Remarks and Equipment Summary	12.3 Log (Log (AIT_1_Inch))
5. Depth Summary	12.4 Parameter Listing
6. Two Main Pass 2" = 100'	
6.1 Integration Summary	
6.2 Composite Summary	
6.3 Log (Log (AIT_2_Inch))	
6.4 Parameter Listing	
7. Two Main Pass 5" = 100'	
7.1 Integration Summary	
7.2 Composite Summary	
7.3 Log (Log (AIT_5_Inch))	
7.4 Parameter Listing	

- 7.4 Parameter Listing
8. Two Main Pass 5" = 100'
 - 8.1 Composite Summary
 - 8.2 Log (Log (AIT_5_Inch) RA)
9. Two Repeat Pass 5" = 100'
 - 9.1 Integration Summary
 - 9.2 Composite Summary
 - 9.3 Log (Copy of Log (AIT_5_Inch))
10. Calibration Report
11. Tail

Remarks and Equipment Summary

Two: Toolstring				Two: Remarks
Equip name LEH-QC:1317	Length 82.94	MP name	Offset	Toolstring run as per toolsketch.
EDTC-B:9071 EDTH-B:8196 EDTG-A:79243 EDTC-B:9071	80.48			Bowspring used to eccentralize HGNS.
				0.125" standoff created by wear-ring on HGNS.
				1.5" standoffs used on AIT, and DSLT.
				Porosity computed on a Limestone scale with density of 2.71 g/cc and slowness of 47.6 us/ft.
				Rig: Precision 107
HNGS-BA:84 HEH-K:1035 HNGS-BA:84	73.98			Your Schlumberger Crew: Tyler Bolton, Adam Jaramillo, Jose Gomez.
HNGC-B:610 HNGH-A:4094 HNGC-B:610	65.79			
HGNS-B:951 HGNH:3894 NPV-N NSR-F:2683 HACCZ-B:448 HMCA-B HGNS-B:951	62.29			
HDRS-B:1829 ECH-MEB:952 HRCC-B:839 HRMS-B:1829 Short Spacing:27483 Backscatter Long Spacing:28774 GSR-J:5339	52.88			



SP 0.08
Mud Resistivity 0.00
TOOL_ZERO

Lengths are in ft

Maximum Outer Diameter = 9.000 in

Line: Sensor Location, Value: Gating Offset

All measurements are relative to TOOL_ZERO

Depth Summary

Two

Depth Measuring Device

Type IDW-JA
Serial Number 5910
Calibration Date 02-Jun-2014
Calibrator Serial Number
Calibration Cable Type 7-46P XS
Wheel Correction 1 -2
Wheel Correction 2 -1

Tension Device

Type CMTD-B/A
Serial Number 5044
Calibration Date 18-Oct-2014
Calibrator Serial Number 80725A
Number of Calibration Points 10
Calibration Root Mean Square Error 19
Calibration Peak Error 36

Logging Cable

Type 7-46P-XS
Serial Number U711059
Length 15500.00 ft
Conveyance Type Wireline
Rig Type Land

Two:Depth Control Parameters

Log Sequence Subsequent Trip To the Well
Reference Log Name Platform Express-CNL
Reference Log Run Number One
Reference Log Date 01-Nov-2014
Subsequent Trip Down Log Correction 7.29 ft

Depth Control Remarks

All primary and secondary depth control procedures followed.
IDW used as primary depth control device.
Z-chart used as secondary depth control device.

Disclaimer

RUN 3

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

Contents

1. Header
2. Disclaimer
3. Contents
4. Operational Run Summary
5. Borehole Fluids
6. Remarks and Equipment Summary
7. Depth Summary
8. Run 3a Main Pass 2"=100'

- 13.2 Composite Summary
- 13.3 Log (HRLA_1_inch)

8.1 Integration Summary	
8.2 Software Version	
8.3 Composite Summary	
8.4 Log (HRLA_2_inch)	
9. Run 3a Main Pass 5"=100'	
9.1 Integration Summary	
9.2 Composite Summary	
9.3 Log (HRLA_5_Inch)	
9.4 Parameter Listing	
10. Run 3a Repeat Analysis 5"=100'	
10.1 Composite Summary	
10.2 Log (HRLA_5_Inch RA)	
11. Calibration Report	
12. Tail	
13. Run 3a Main Pass 1"=100'	
13.1 Integration Summary	

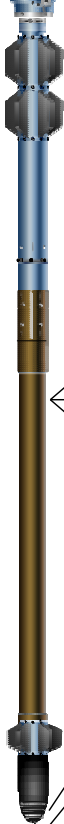
Operational Run Summary

Parameter (unit)	Run 3a					
Date Log Started	10-Dec-2014					
Time Log Started	03:52:06					
Date Log Finished	10-Dec-2014					
Time Log Finished	06:35:47					
Top Log Interval (ft)	8594.00					
Bottom Log Interval (ft)	9247.00					
Total Depth (ft)	9247.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	8.500					
Logging Unit Number	2381					
Logging Unit Location	Midland, TX					
Recorded By	Matt Clardy/ Phil Lacasse					
Witnessed By	Russell Bentley					
Service Order Number	D0M2-00023					

Borehole Fluids

Parameter(unit)	Run 3a					
Fluid Type	Water					
Fluid Name	Fresh Water					
Max Recorded Temperatures (degF)	138					
Source of Sample	Active Tank					
Salinity (ppm)	500					
Density (lbm/gal)	10.1					
Funnel Viscosity (s)	42					
Fluid Loss (cm3)	0					
PH	10.5					
Date/Time Circulation Stopped	09-Dec-2014 08:00:00					

AIT-M:190 16.00
AMIS:190
AMRM:190



Temperature 7.91
Induction 7.91
Power Supply 7.91

SP 0.08
Mud Resistivity 0.00

TOOL_ZERO

Lengths are in ft

Maximum Outer Diameter = 7.000 in

Line: Sensor Location, Value: Gating Offset

All measurements are relative to TOOL_ZERO

Depth Summary

Run 3a

Depth Measuring Device

Type	IDW-B		
Serial Number	6568		
Calibration Date	28-Jul-2014		
Calibrator Serial Number			
Calibration Cable Type	7-46P/AXS		
Wheel Correction 1	-4		
Wheel Correction 2	-3		

Tension Device

Type	CMTD-B/A		
Serial Number	8100		
Calibration Date	18-Nov-2014		
Calibrator Serial Number	U713032		
Number of Calibration Points	10		
Calibration Root Mean Square Error	16		
Calibration Peak Error	20		

Logging Cable

Type	7-46P-XS		
Serial Number	U713032		
Length	23800.00 ft		
Conveyance Type	Wireline		
Rig Type			

Run 3a:Depth Control Parameters

Log Sequence	First Log in the Well	All Schlumberger depth control procedures to date followed. All passes correlated to previous SLB log in well dated 11/30/14. CMTD used as primary tension control. CMTD last calibrated on 11-Nov-2014. IDW used as primary means of depth control. Z-chart used as secondary means of depth control. IDW calibrated on 28-Jul-2014.
Rig Up Length At Surface		
Rig Up Length At Bottom		
Rig Up Length Correction		

Log Up Length Correction	
Stretch Correction	
Tool Zero Check At Surface	

Main Pass 2"=100'

Software Version	
------------------	--

Acquisition System	Version
MaxWell	4.0.9163.3000
Application Patch	Patch-SP-10767_18214-4.0.9163.3001
	Patch-NPD_NEXT_C_Fld2-20493-4.0.9434.3002
	Patch-Hotfix_Task_Tree_GDI_SP2-20806-4.0.9434.3002
	Patch-NPD_CMRTF_SP2-22354-4.0.9434.3002

Computation	Description		Version
DepthCorrection	DepthCorrection		4.0.9433.3000
Tool Elements	Description	Software Version	Firmware Version
PPC-B	PPC-B Element is used for usual logging at wellsite and check/diagnostics.	4.0.9433.3000	1.0
AMIS	Array Induction Sonde - M	4.0.9427.3000	1
EDTC-B	Enhanced Digital Telemetry Cartridge - B	4.0.9433.3000	

Pass Summary	
--------------	--

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Main[3]:Up	Up	40.69 ft	1545.04 ft	12-Oct-2014 10:12:58 AM	12-Oct-2014 10:42:41 AM	ON	0.90 ft	No

All depths are referenced to toolstring zero

Log	Company:PB ENERGY STORAGE SERVICES, INC Well:LINAM #2 One: Main[3]:Up:S007
-----	--

Description: HRLT BASIC LOG Format: Log (HRLA_2_inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-Oct-2014 11:45:42

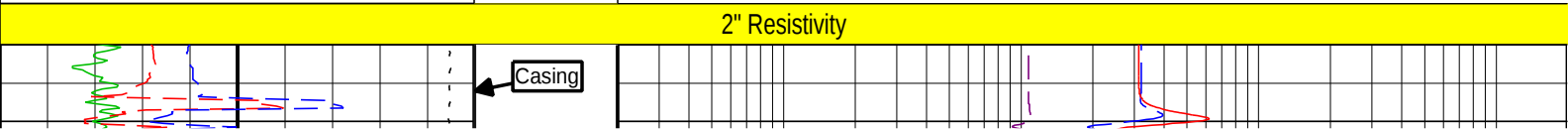
Channel	Source	Sampling
AT30	AIT-M:AMIS:AMIS	3in
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
GR_CAL	EDTC-B:EDTC-B:EDTC-B	6in
HD1	PPC-B:PPC-B:PPC-B	6in
HD2	PPC-B:PPC-B:PPC-B	6in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

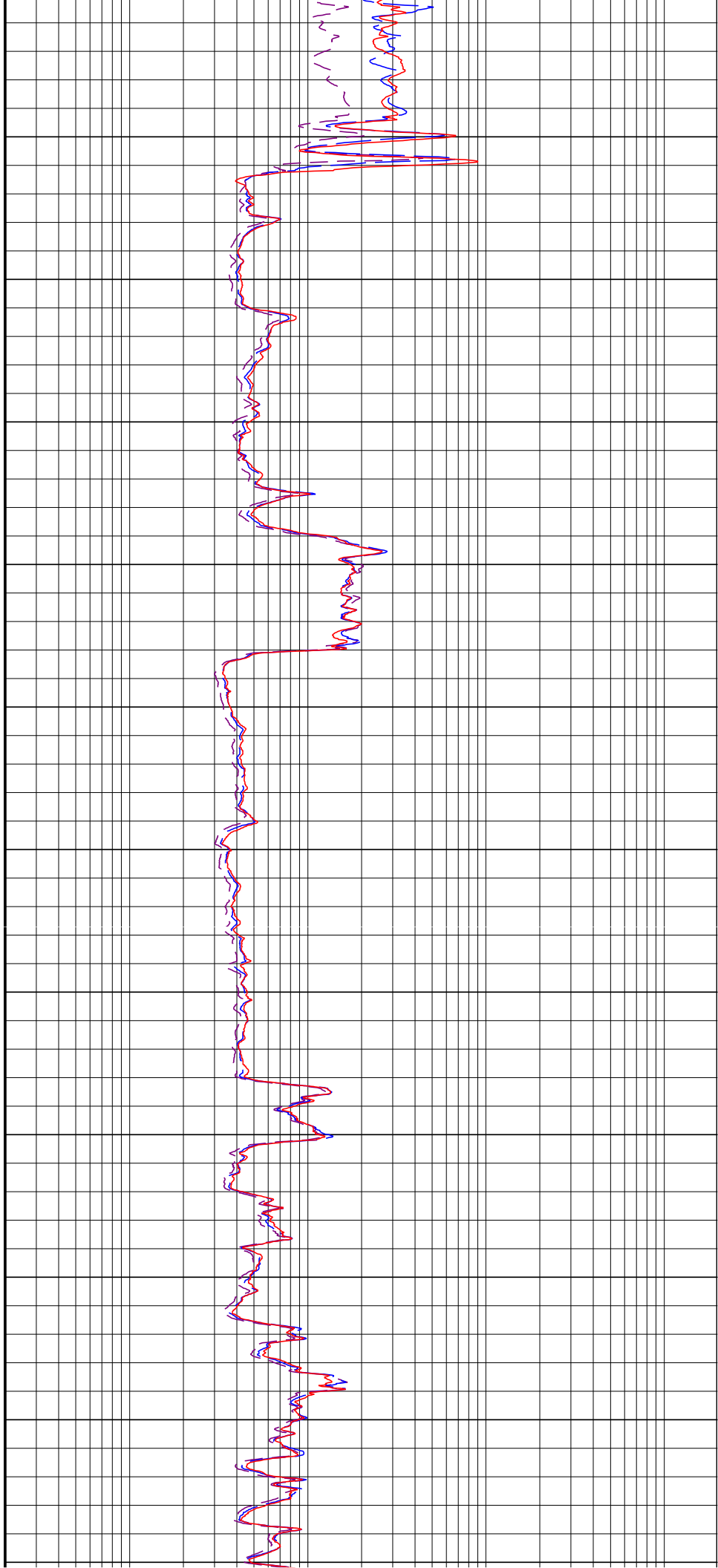
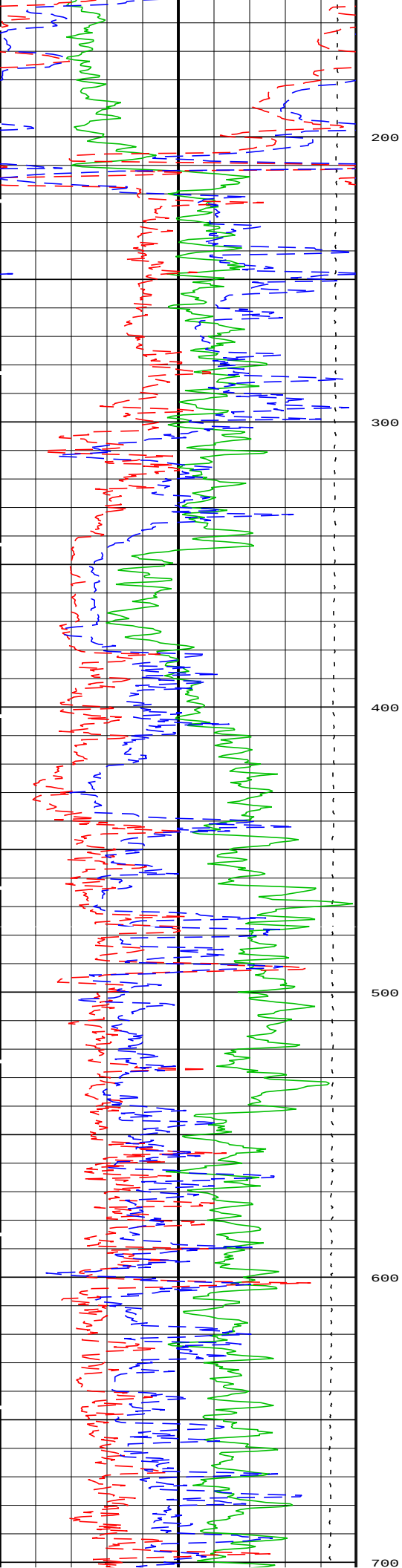
TIME_1900 - Time Marked every 60.00 (s)

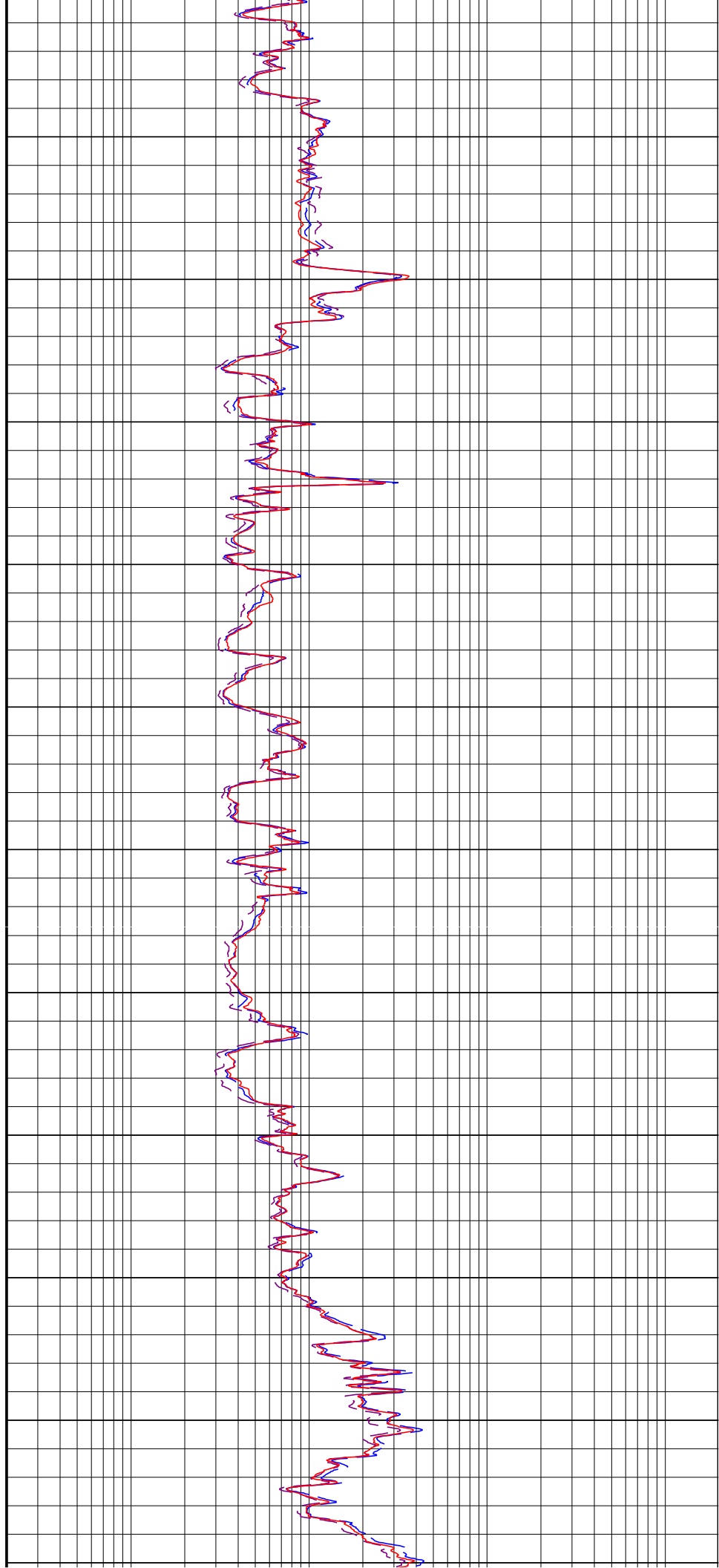
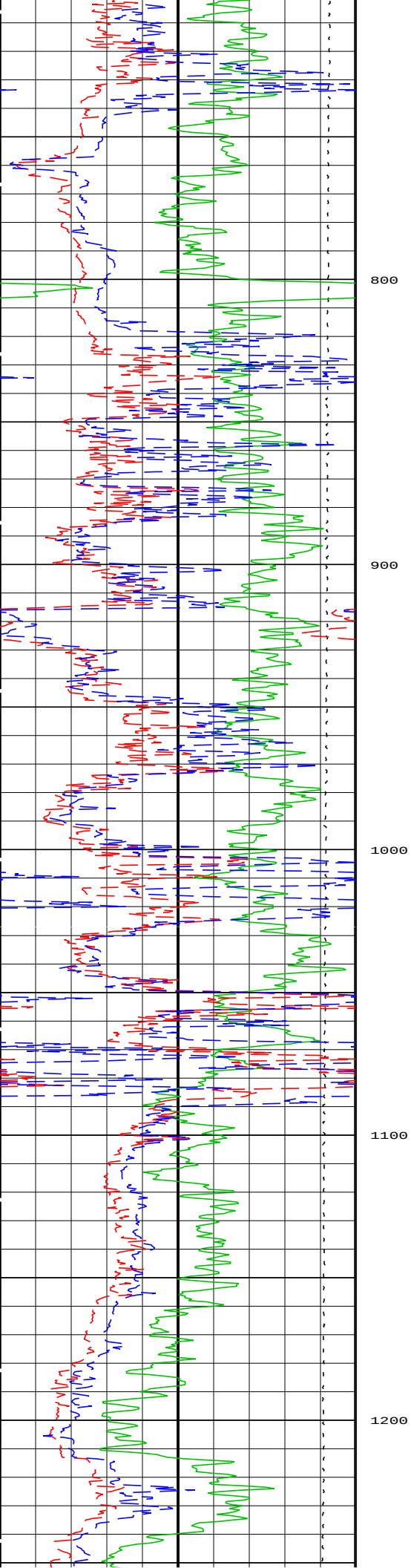
Cable Tension (TENS)		
10000	lbf	0
GR		
0	gAPI	100
Hole Diameter 1 (HD1) PPC-B		
16	in	26
Hole Diameter 2 (HD2) PPC-B		
16	in	26

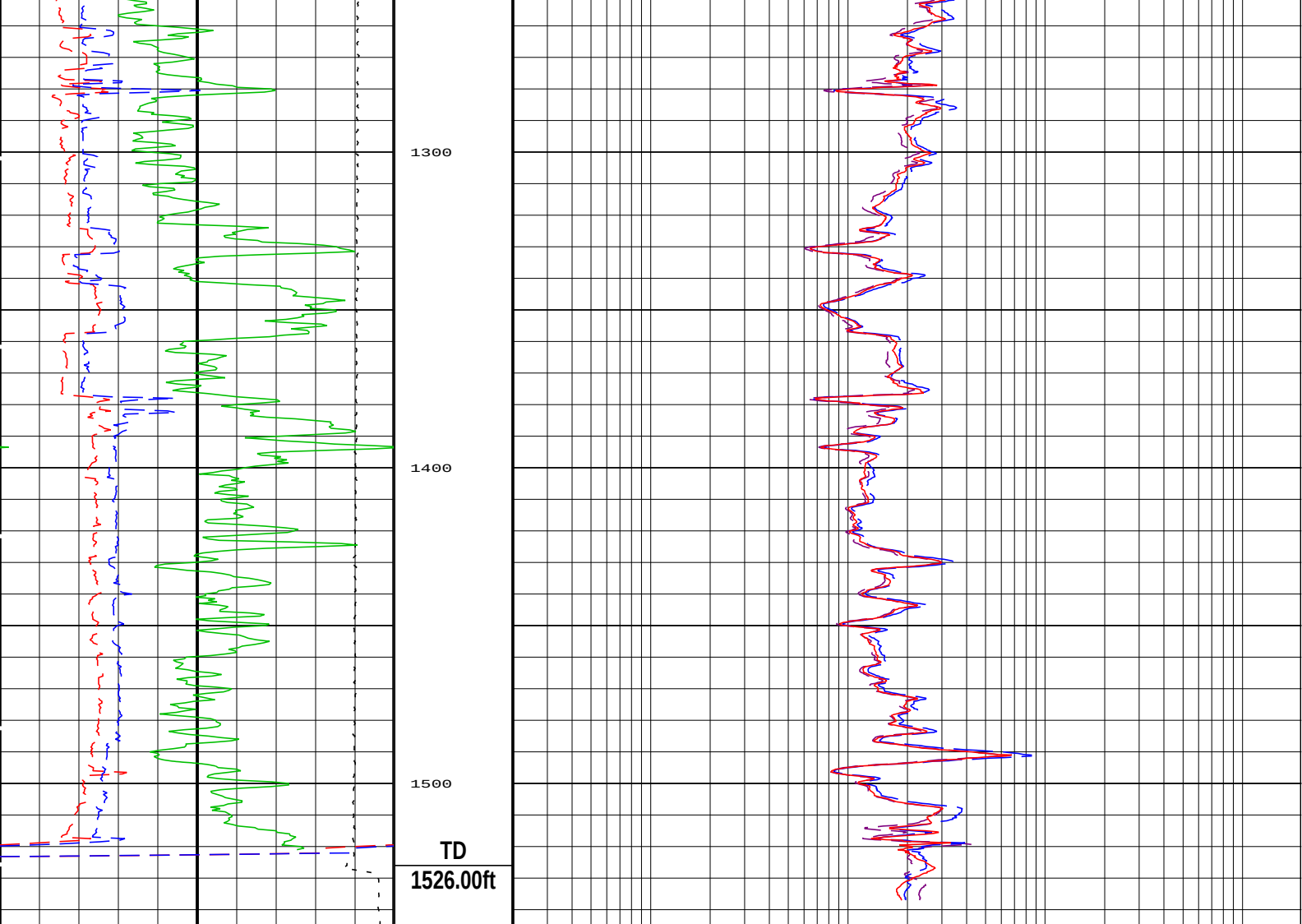
RUN 1

Array Induction Two Foot Resistivity A30 (AT30) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A60 (AT60) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A90 (AT90) AIT-M		
0.2	ohm.m	2000









2" Resistivity

Cable Tension (TENS)		
10000	lbf	0
GR		
0	gAPI	100
Hole Diameter 1 (HD1) PPC-B		
16	in	26
Hole Diameter 2 (HD2) PPC-B		
16	in	26

Array Induction Two Foot Resistivity A30 (AT30) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A60 (AT60) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A90 (AT90) AIT-M		
0.2	ohm.m	2000

TIME_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG Format: Log (HRLA_2_inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-Oct-2014 11:45:42

Main Pass 2"=100'

Software Version			
Acquisition System		Version	
MaxWell		4.0.9163.3000	
Application Patch		Patch-SP-10767_22480-4.0.9163.3001	
Computation	Description		Version
DepthCorrection	DepthCorrection		4.0.9469.3000
Tool Elements	Description	Software Version	Firmware Version
HRLT-B	HRLT-B Sonde	4.0.9401.3000	DSP: 2.1 HOST: 0.a

HGNS-B	HILT Gamma-Ray and Neutron Sonde, 125 degC	4.0.9385.3000	2.0
HRCC-B	HILT High-Resolution Control Cartridge, 125 degC	4.0.9385.3000	2.0

Pass Summary									
Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Main[5]:Up	Up	810.48 ft	3245.53 ft	01-Nov-2014 5:51:35 AM	01-Nov-2014 6:34:07 AM	ON	3.59 ft	Yes

All depths are referenced to toolstring zero

Log	Company:PB ENERGY STORAGE SERVICES, INC Well:DCP Linam Ranch AGI #2 One: Main[5]:Up:S012								
-----	--	--	--	--	--	--	--	--	--

Description: HRLT BASIC LOG Format: Log (HRLA_2_inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 01-Nov-2014 06:52:53

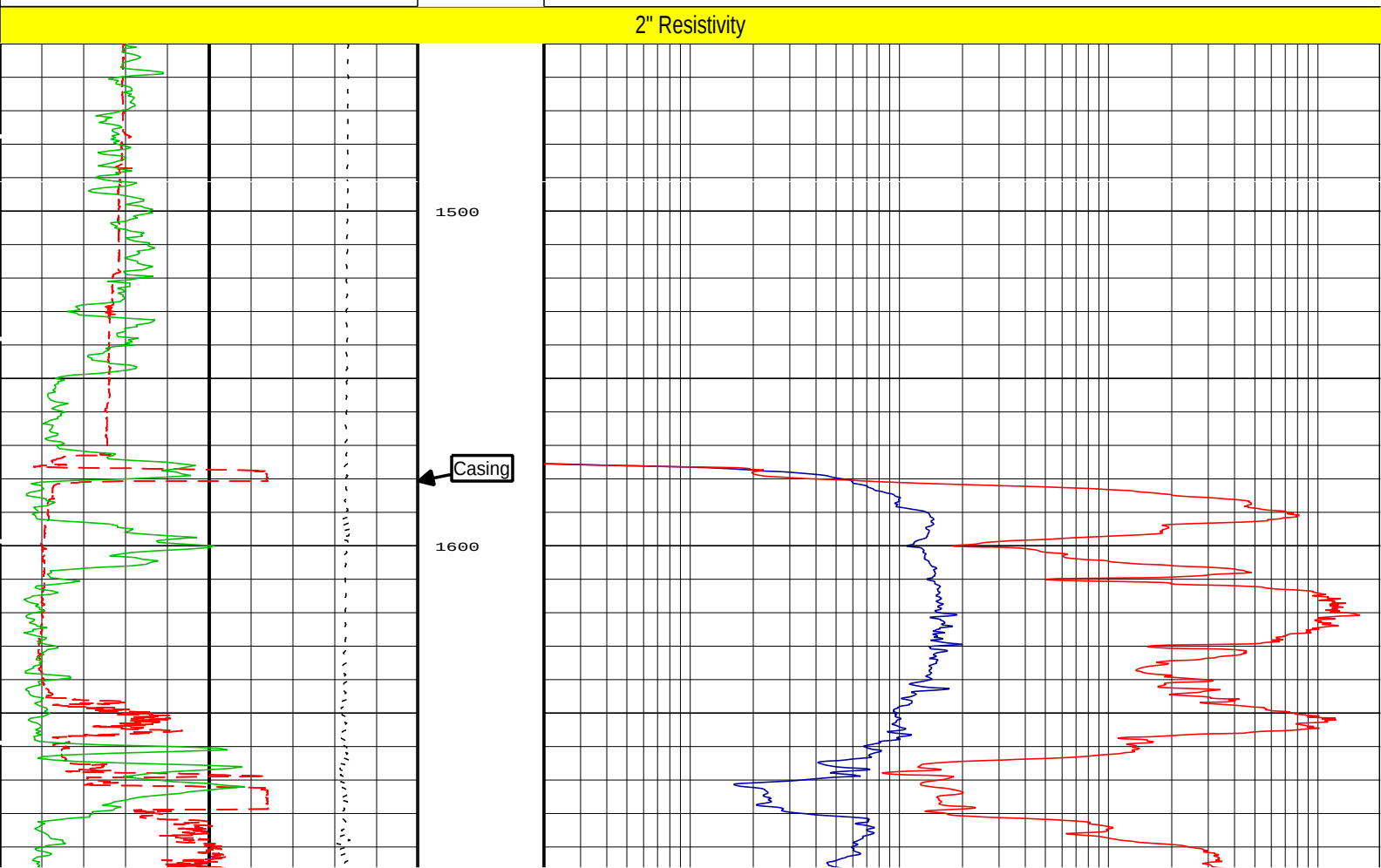
Channel	Source	Sampling
CALI	HDRS-B:HRCC-B:HRCC-B	1in
GR_CAL	HGNS-B:HGNS-B:HGNS-B	6in
RLA3	HRLT-B:HRLS-B:HRLS-B	2in
RLA5	HRLT-B:HRLS-B:HRLS-B	2in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

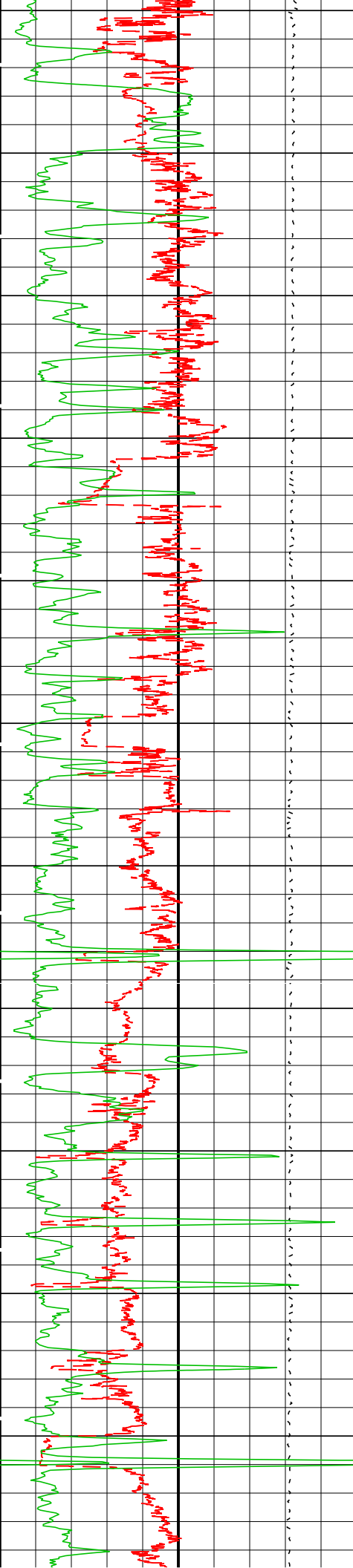
TIME_1900 - Time Marked every 60.00 (s)

Cable Tension (TENS)		
10000	lbf	0
Caliper (CALI) HDRS-B		
6	in	16
GR		
0	gAPI	100

RUN 2

Apparent Resistivity from Computed Focusing Mode 3 (RLA3) HRLT-B		
0.2	ohm.m	2000
Apparent Resistivity from Computed Focusing Mode 5 (RLA5) HRLT-B		
0.2	ohm.m	2000





1700

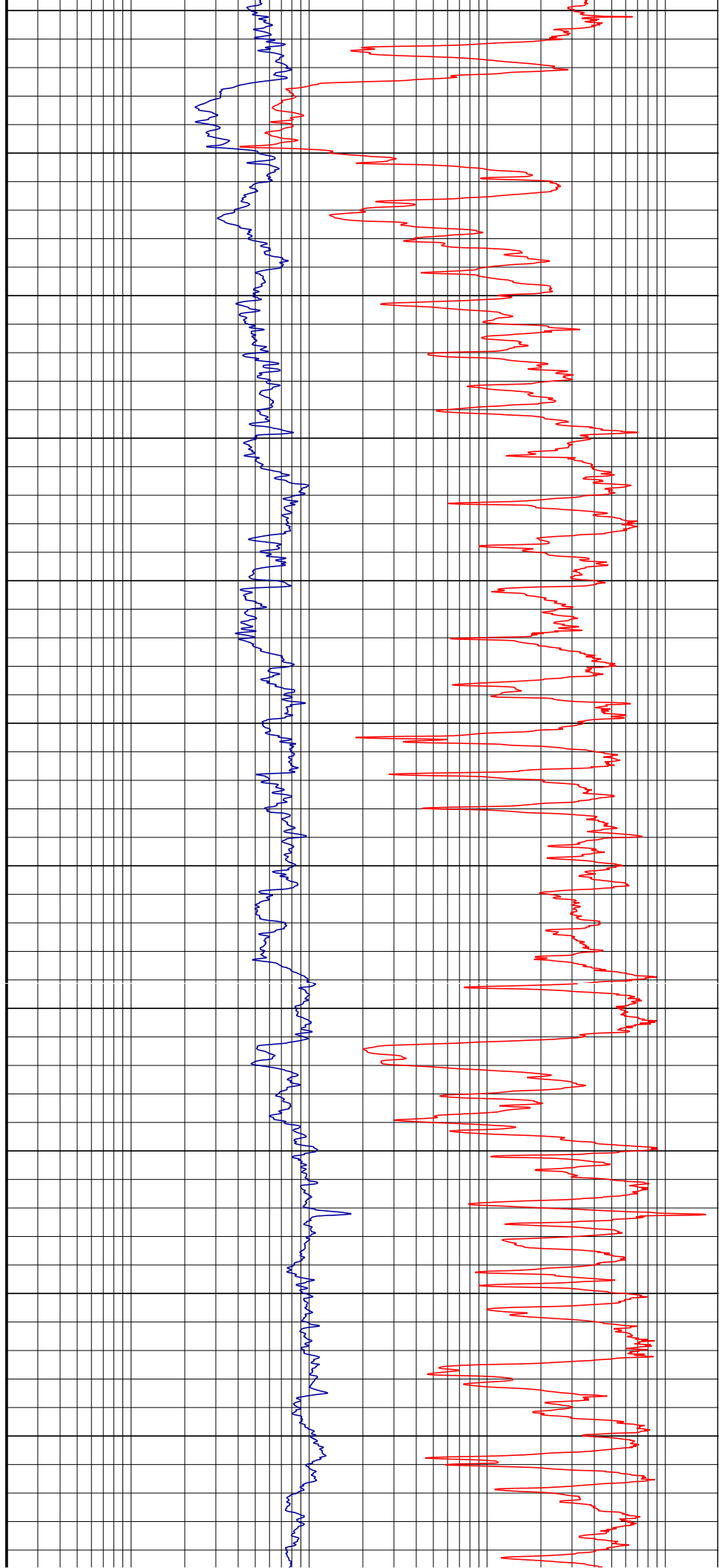
1800

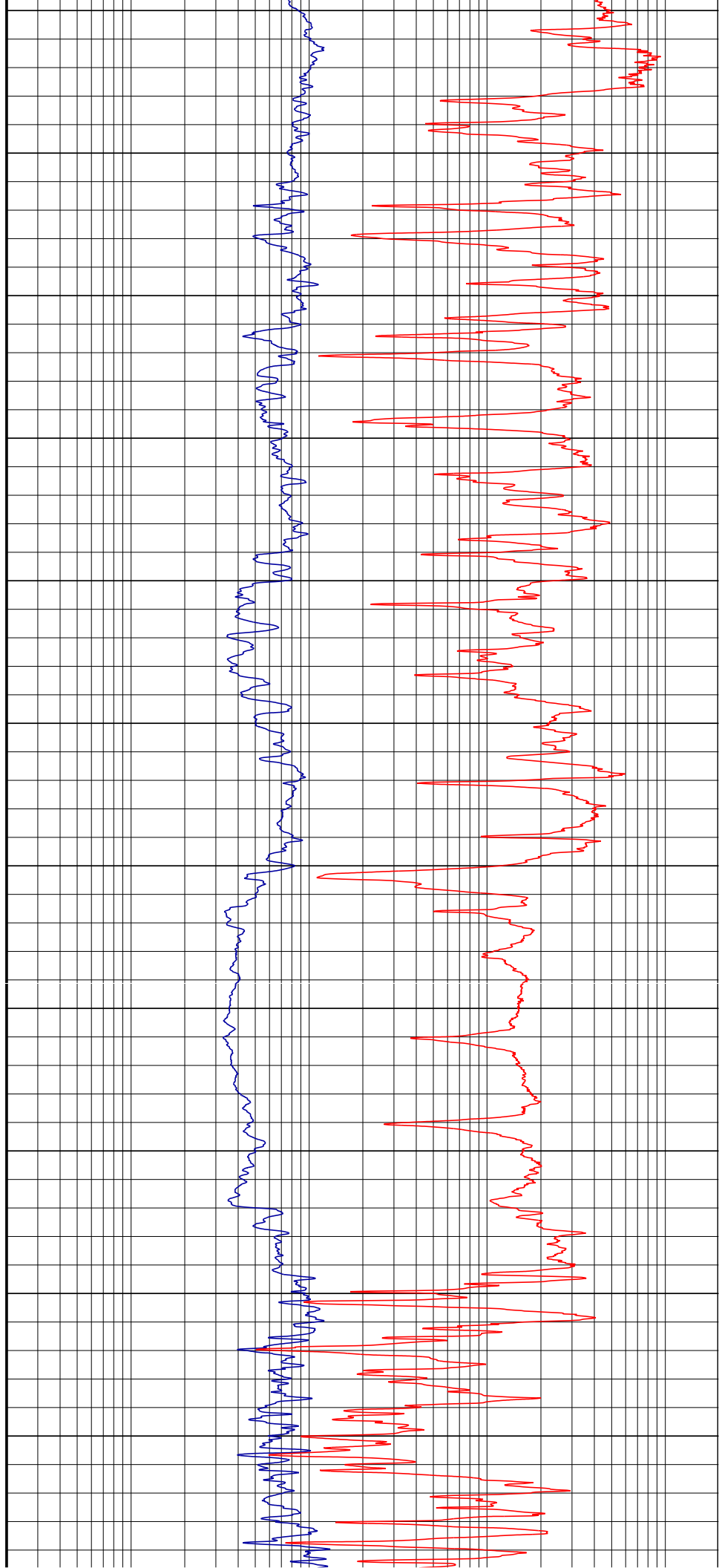
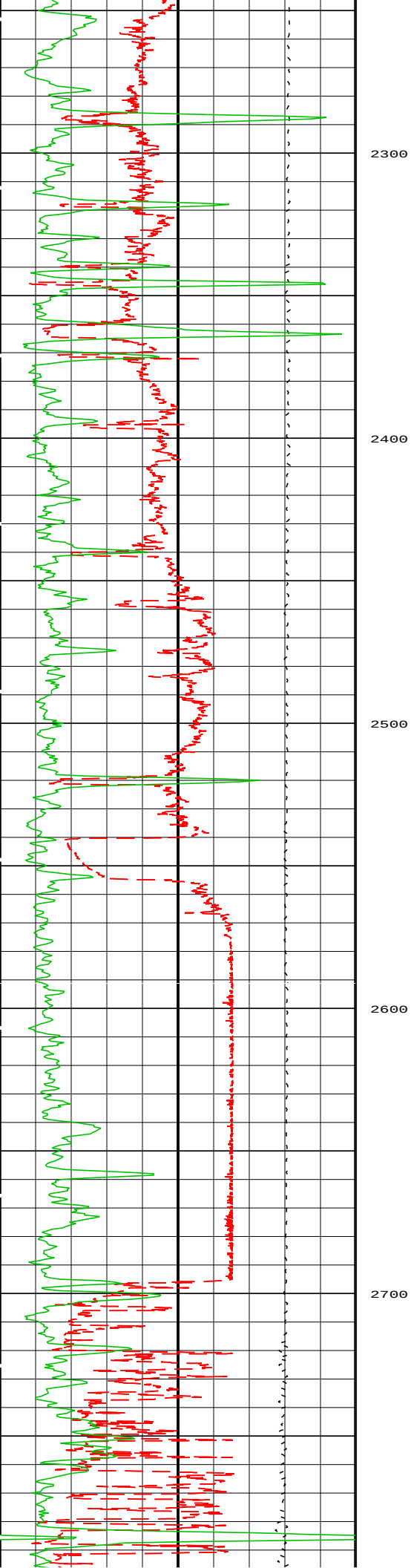
1900

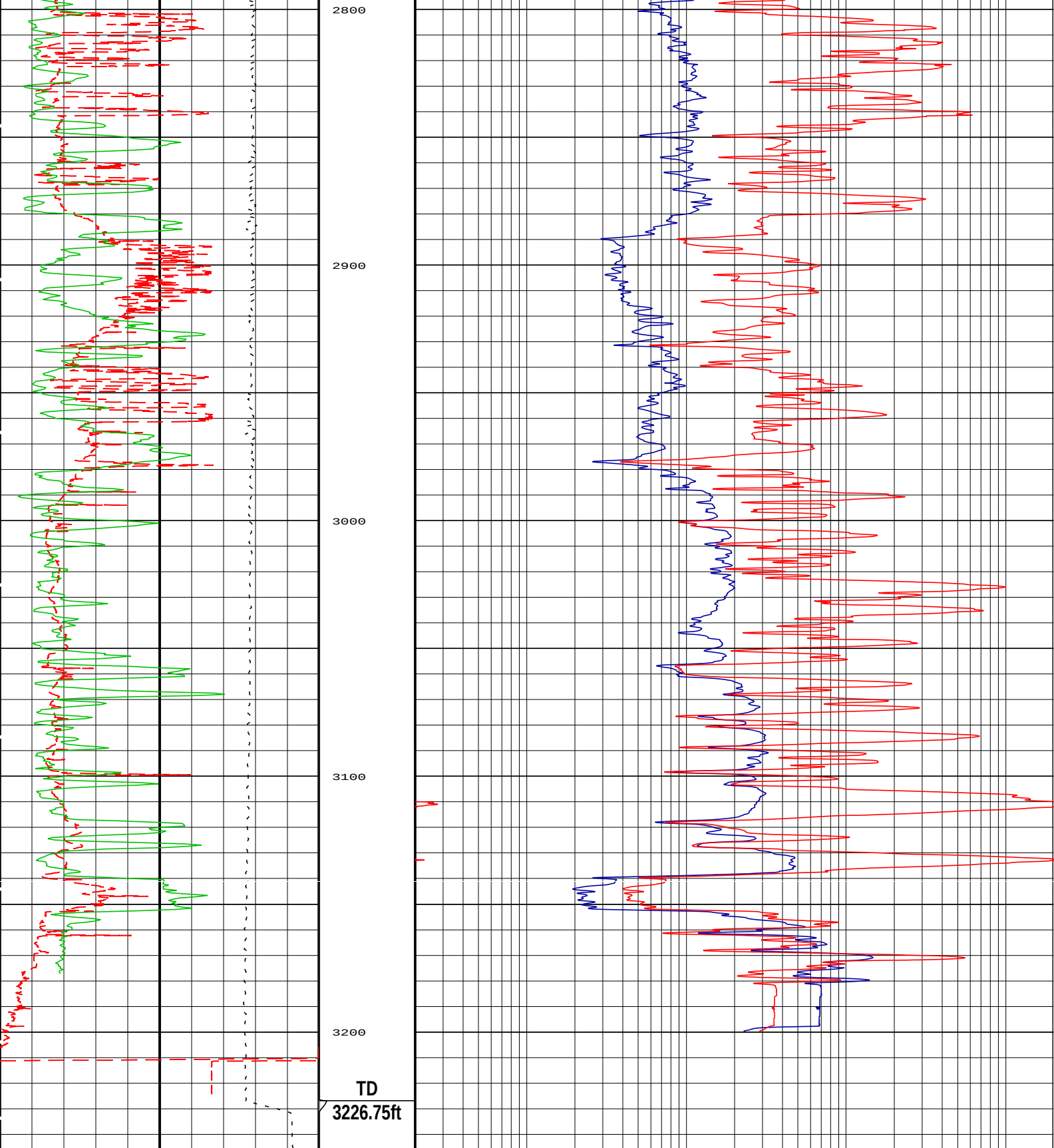
2000

2100

2200







2" Resistivity			
Cable Tension (TENS)			
10000	lbf	0	
Caliper (CALI) HDRS-B			
6	in	16	
GR			
0	gAPI	100	
TIME_1900 - Time Marked every 60.00 (s)			
Apparent Resistivity from Computed Focusing Mode 3 (RLA3) HRLT-B			
0.2	ohm.m	2000	
Apparent Resistivity from Computed Focusing Mode 5 (RLA5) HRLT-B			
0.2	ohm.m	2000	

Main Pass 2"=100'

Software Version

Acquisition System		Version
MaxWell		4.0.9163.3000
Application Patch		Patch-SP-10767_26570-4.0.9163.3001
		Patch-TestKit_MSCT_KinematicUpgrade_2013C4-28999-4.0.9575.3000

Computation	Description	Version
DepthCorrection	DepthCorrection	4.0.9469.3000

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	4.0.9575.3000	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	4.0.9575.3000	2.0
AMIS	Array Induction Sonde - M	4.0.9535.3000	1

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
Run 3a	Main[3]:Up	Up	8020.70 ft	9265.70 ft	10-Dec-2014 4:51:32 AM	10-Dec-2014 5:17:20 AM	ON	6.53 ft	No

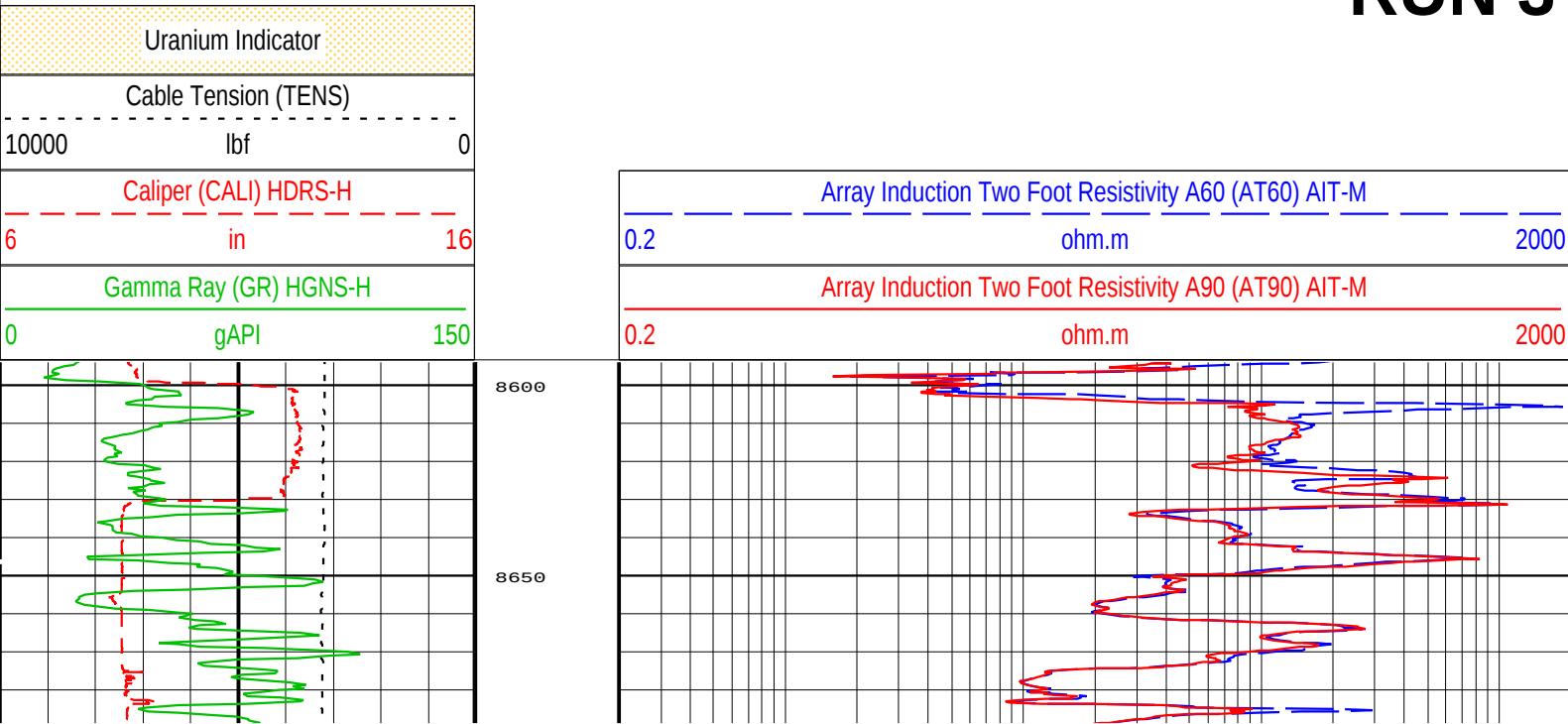
All depths are referenced to toolstring zero

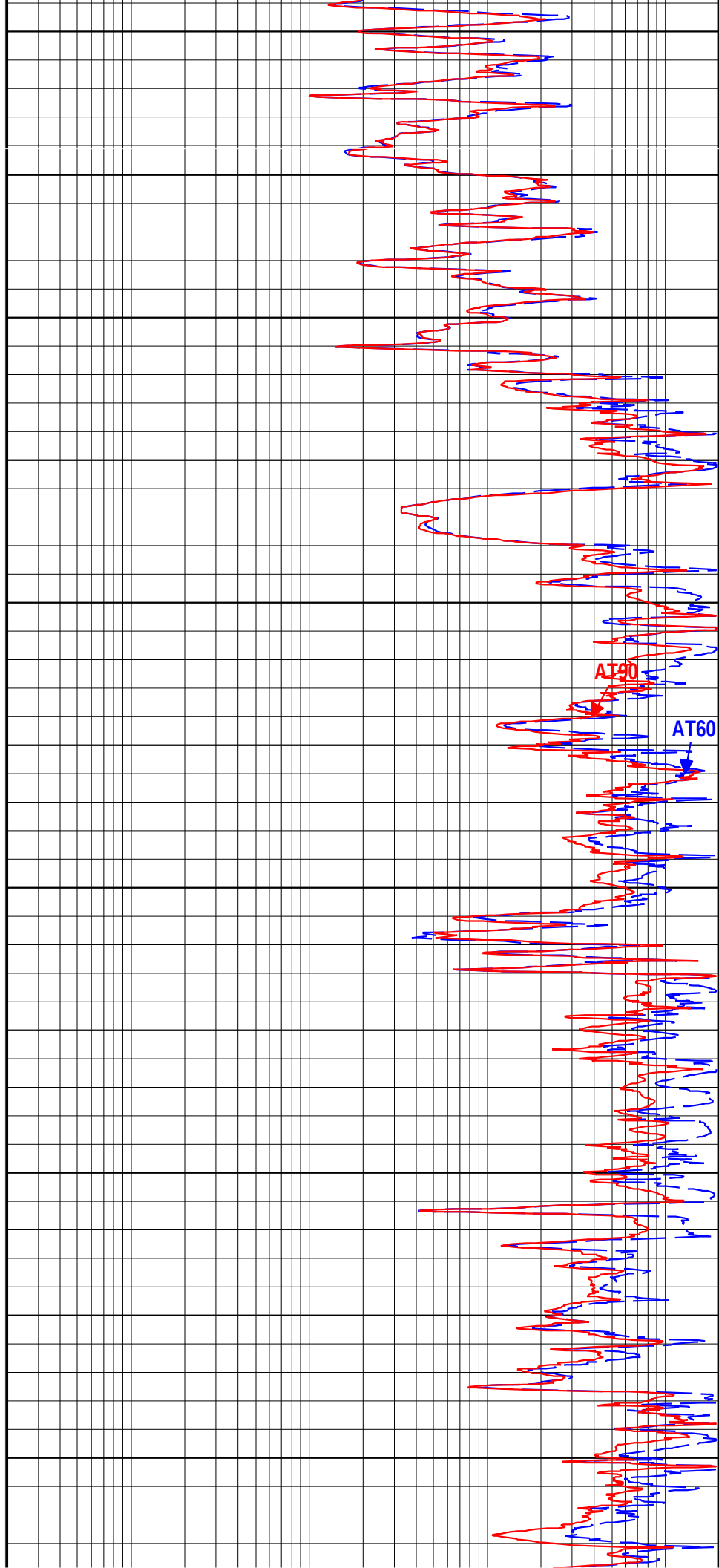
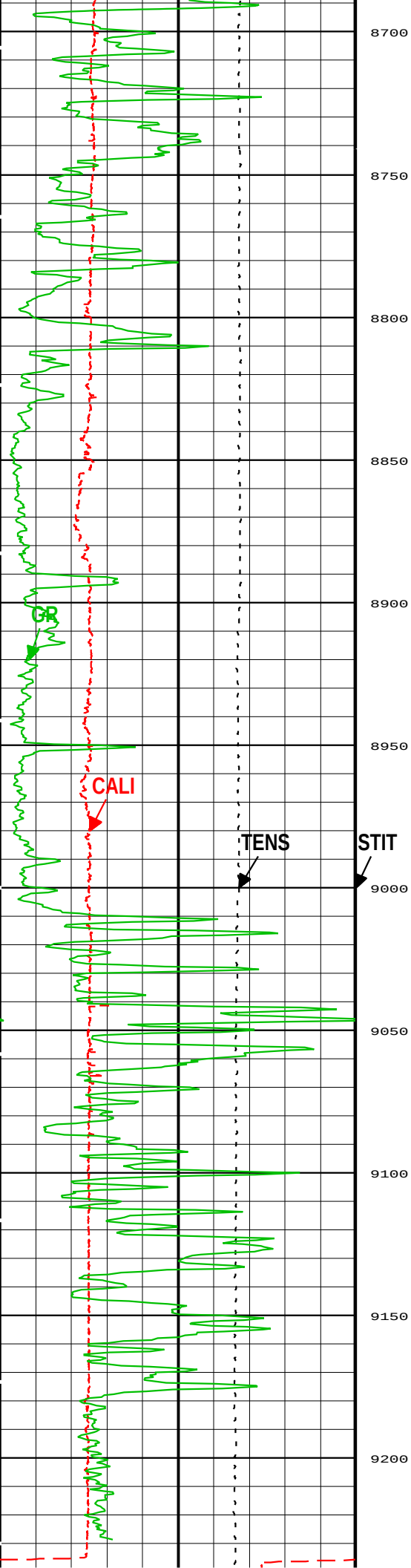
Log	Company:PB ENERGY STORAGE SERVICES, INC Well:DCP Linam Ranch AGI #2 Run 3a: Main[3]:Up:S012
-----	---

Description: HRLT BASIC LOG Format: Log (HRLA_2_inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Dec-2014 09:14:38

Channel	Source	Sampling
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
STIT	DepthCorrection	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

TIME_1900 - Time Marked every 60.00 (s)





TD
9247.00ft

Uranium Indicator

Cable Tension (TENS)
10000 lbf 0

Caliper (CALI) HDRS-H
6 in 16

Gamma Ray (GR) HGNS-H
0 gAPI 150

TIME_1900 - Time Marked every 60.00 (s)

Array Induction Two Foot Resistivity A60 (AT60) AIT-M
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT-M
0.2 ohm.m 2000

Description: HRLT BASIC LOG Format: Log (HRLA_2_inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Dec-2014 09:14:38

Main Pass 1"=100'

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Main[3]:Up	Up	40.69 ft	1545.04 ft	12-Oct-2014 10:12:58 AM	12-Oct-2014 10:42:41 AM	ON	0.90 ft	No

All depths are referenced to toolstring zero

Log

Company:PB ENERGY STORAGE SERVICES, INC Well:LINAM #2
One: Main[3]:Up:S007

Description: HRLT BASIC LOG Format: Log (HRLA_1_inch) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-Oct-2014 11:45:45

Channel	Source	Sampling
AT30	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
GR_CAL	EDTC-B:EDTC-B:EDTC-B	6in
HD1	PPC-B:PPC-B:PPC-B	6in
HD2	PPC-B:PPC-B:PPC-B	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

TIME_1900 - Time Marked every 60.00 (s)

Cable Tension (TENS)
10000 lbf 0

Calibrated Gamma Ray (GR_CAL) EDTC-B
0 gAPI 100

Hole Diameter 1 (HD1) PPC-B
16 in 26

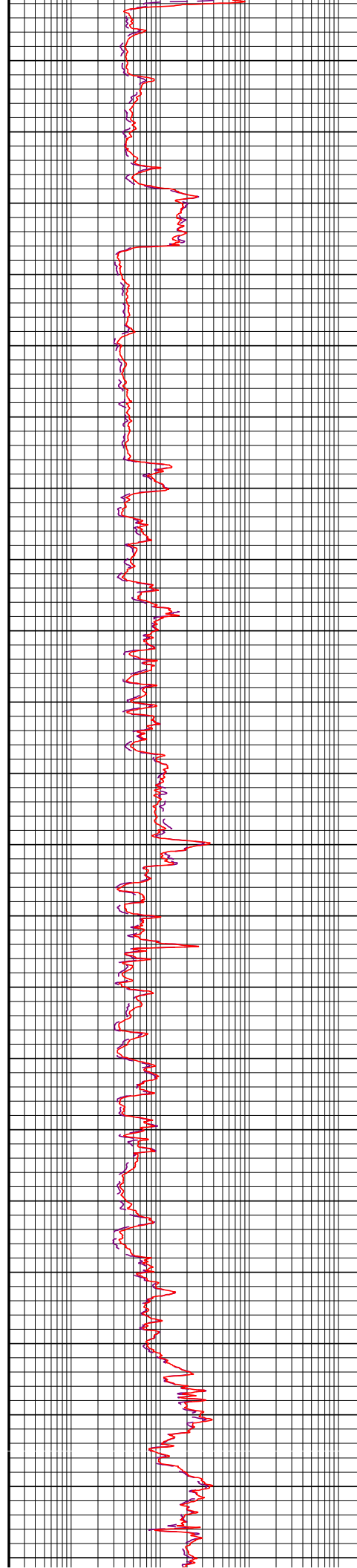
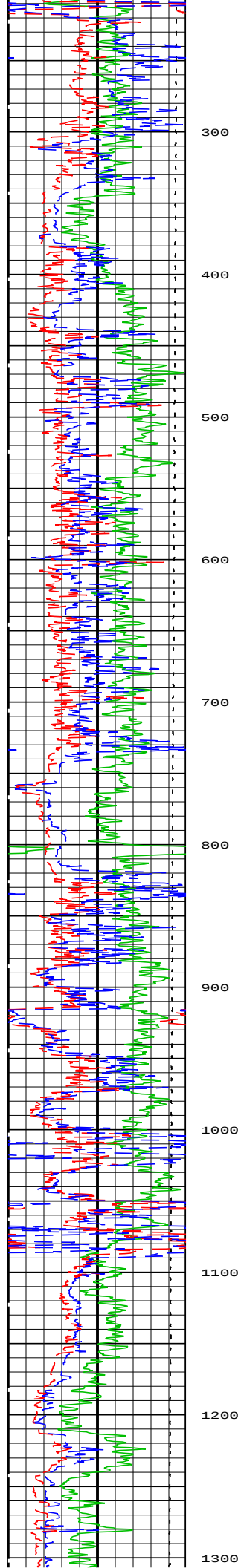
Hole Diameter 2 (HD2) PPC-B
16 in 26

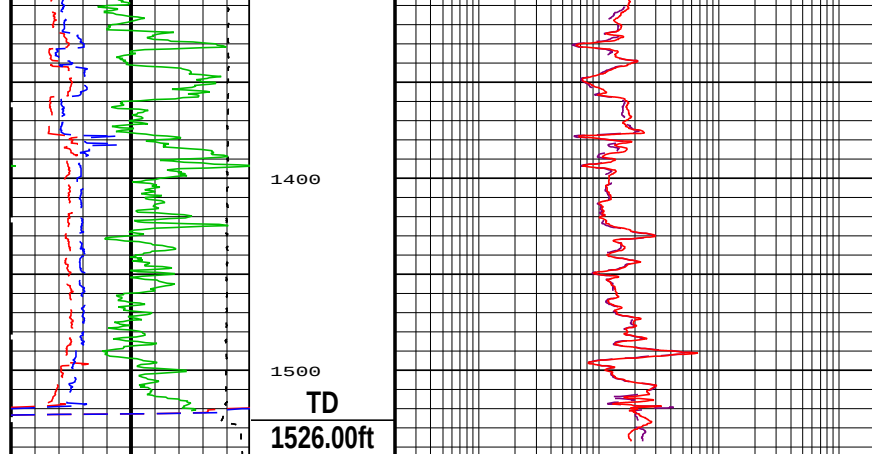
Casing

RUN 1

Array Induction Two Foot Resistivity A30 (AT30) AIT-M
0.2 ohm.m 2000

Array Induction Two Foot Resistivity A90 (AT90) AIT-M
0.2 ohm.m 2000





Cable Tension (TENS)		
10000	lbf	0
Calibrated Gamma Ray (GR_CAL) EDTC-B		
0	gAPI	100
Hole Diameter 1 (HD1) PPC-B		
16	in	26
Hole Diameter 2 (HD2) PPC-B		
16	in	26

Array Induction Two Foot Resistivity A30 (AT30) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A90 (AT90) AIT-M		
0.2	ohm.m	2000

TIME_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG Format: Log (HRLA_1_inch) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-Oct-2014 11:45:45

Main Pass 1" = 100'

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	HVAS, FCD	2381.29	ft3
IHV	Integrated Hole Volume	HVAS	5118.77	ft3

Log Company:PB ENERGY STORAGE SERVICES, INC Well:DCP Linam Ranch AGI #2 Two: Main[3]:Up:S021

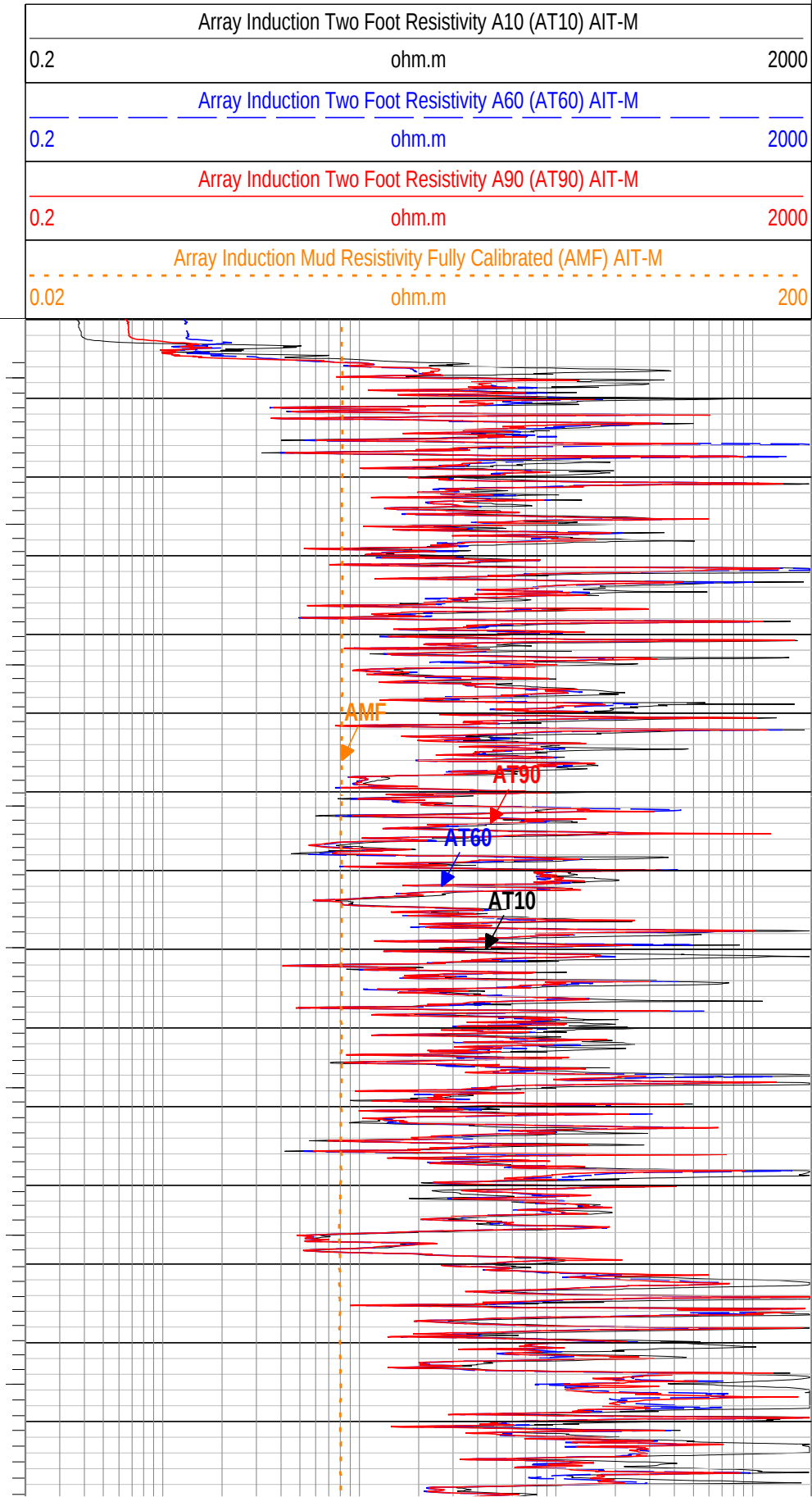
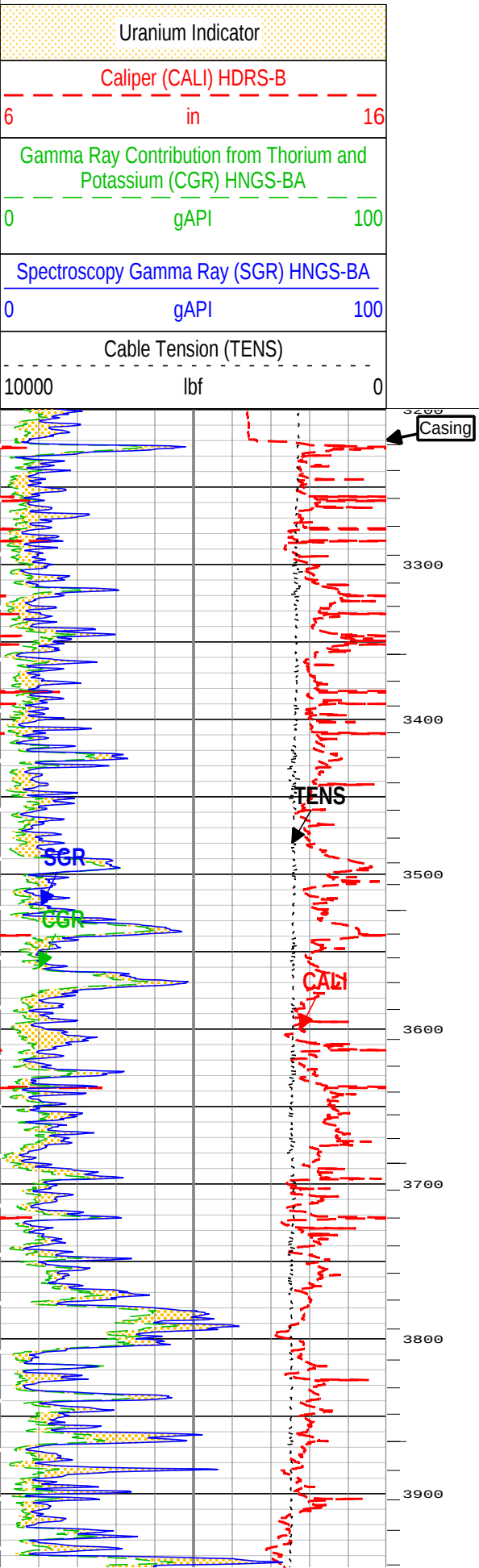
Description: AIT Basic Log Two Format: Log (Log (AIT_1_Inch)) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 30-Nov-2014 17:11:13

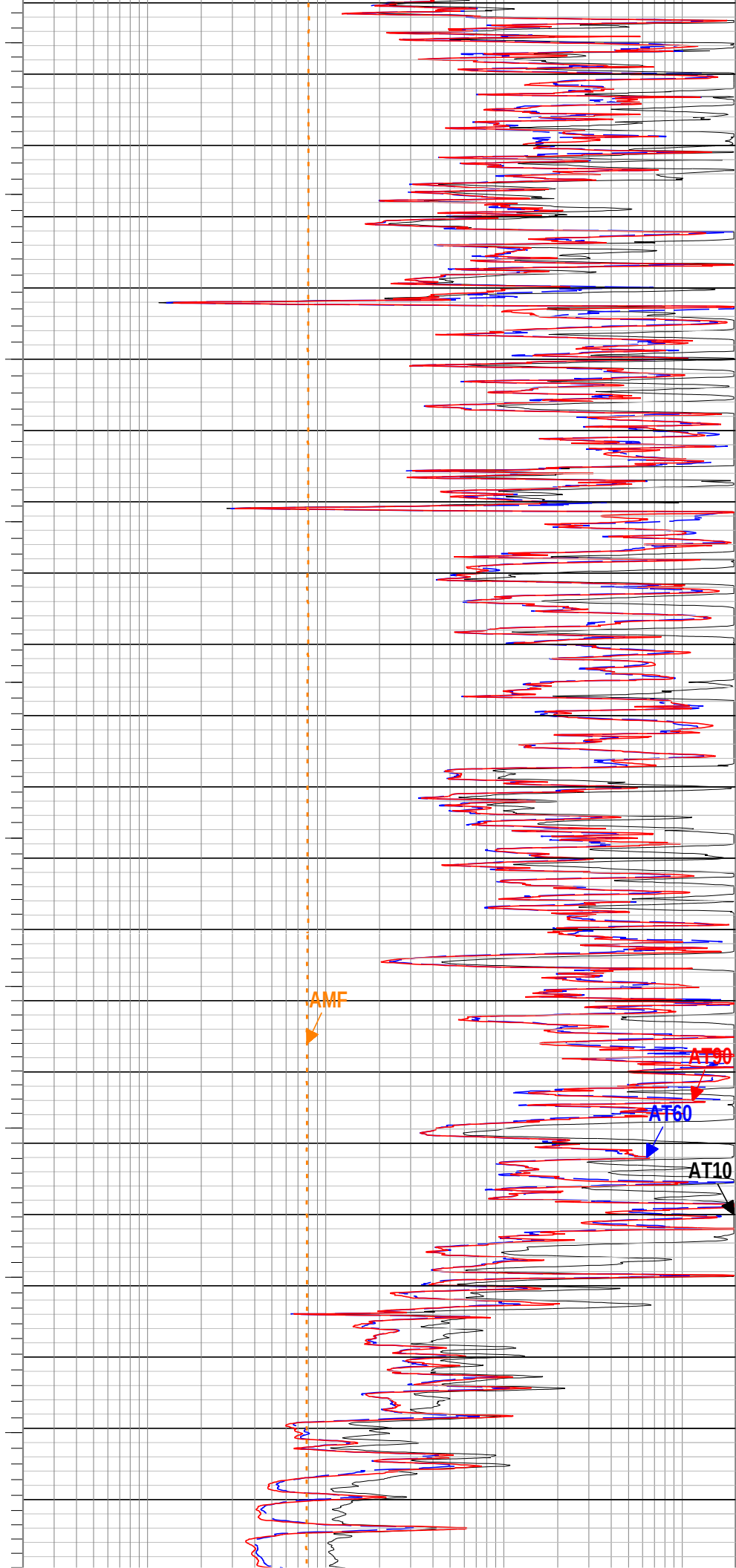
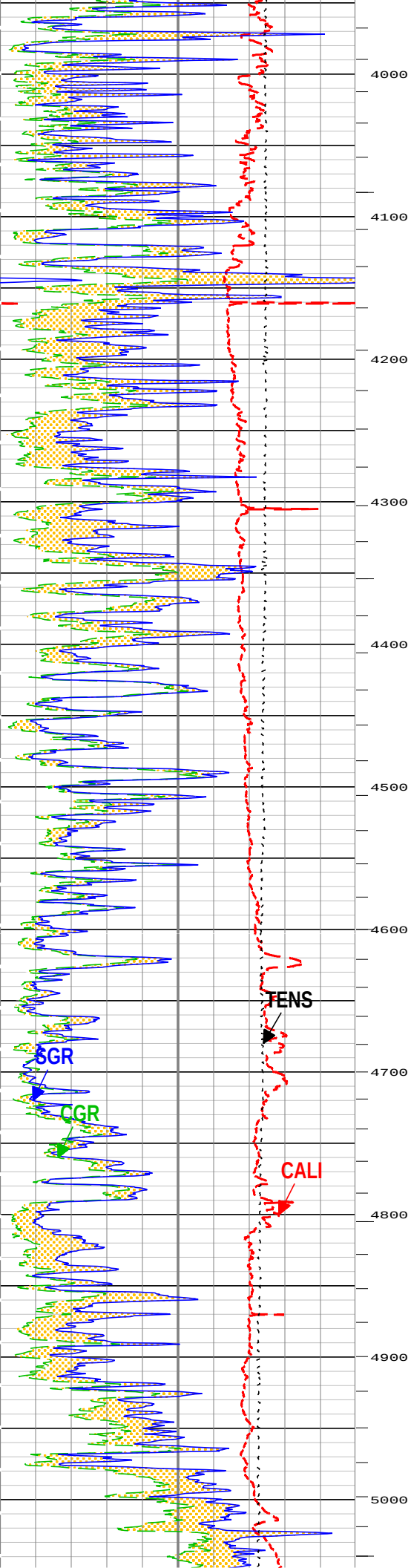
Channel	Source	Sampling
AMF	AIT-M:AMIS:AMIS	12in
AT10	AIT-M:AMIS:AMIS	3in
AT60	AIT-M:AMIS:AMIS	3in
AT90	AIT-M:AMIS:AMIS	3in
CALI	HDRS-B:HRCC-B:HRCC-B	1in
CGR	HNGS-BA:HNGS-BA:HNGS-BA	6in
ICV	Borehole	6in
IHV	Borehole	6in
SGR	HNGS-BA:HNGS-BA:HNGS-BA	6in
TENS	WLWorkflow	6in
TIME_1900	WLWorkflow	0.1in

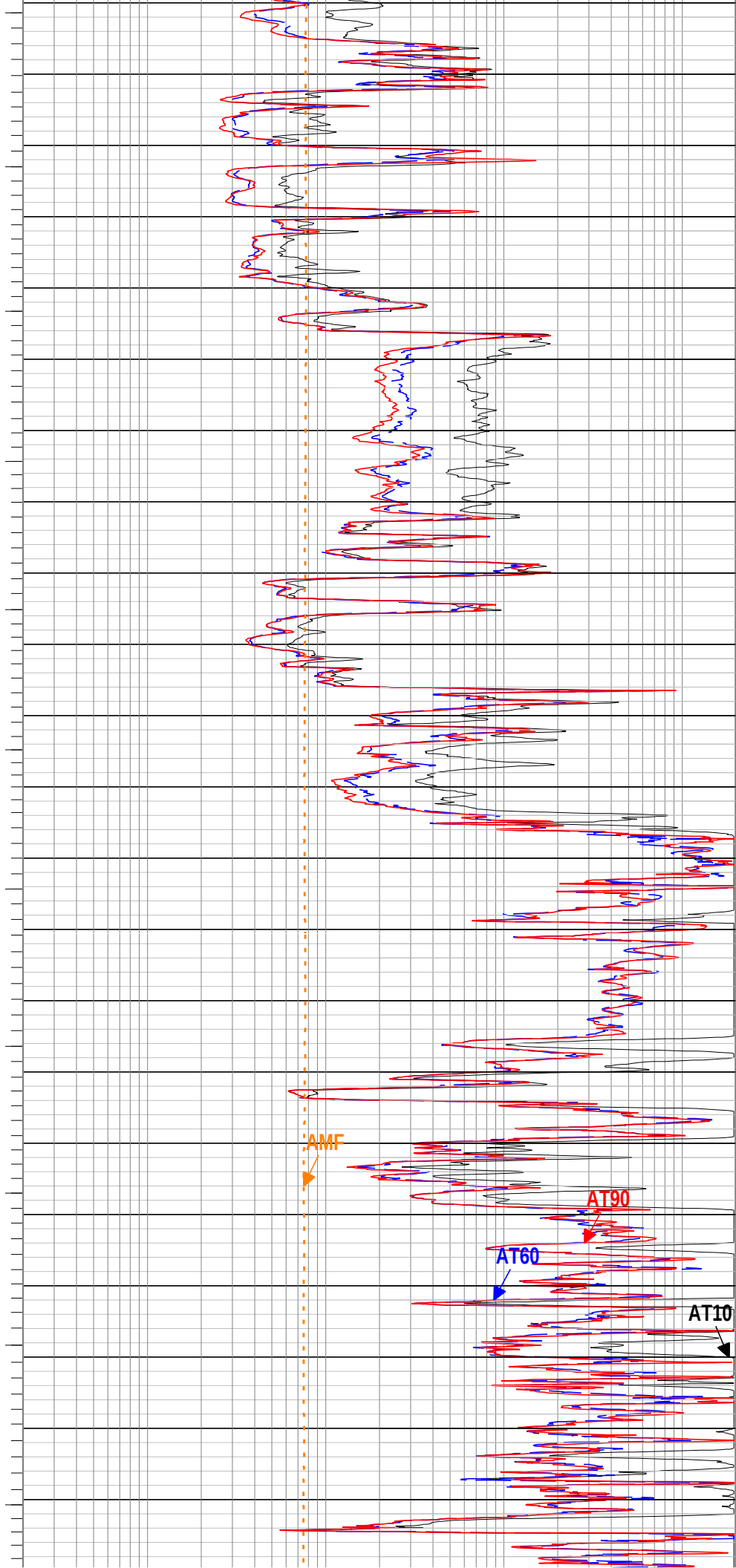
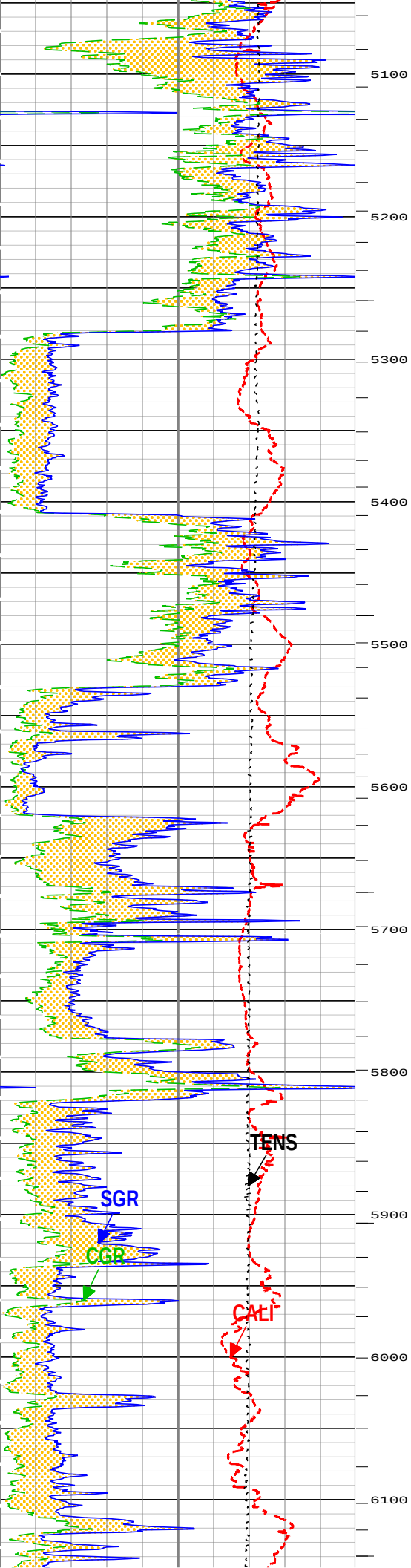
TIME_1900 - Time Marked every 60.00 (s)

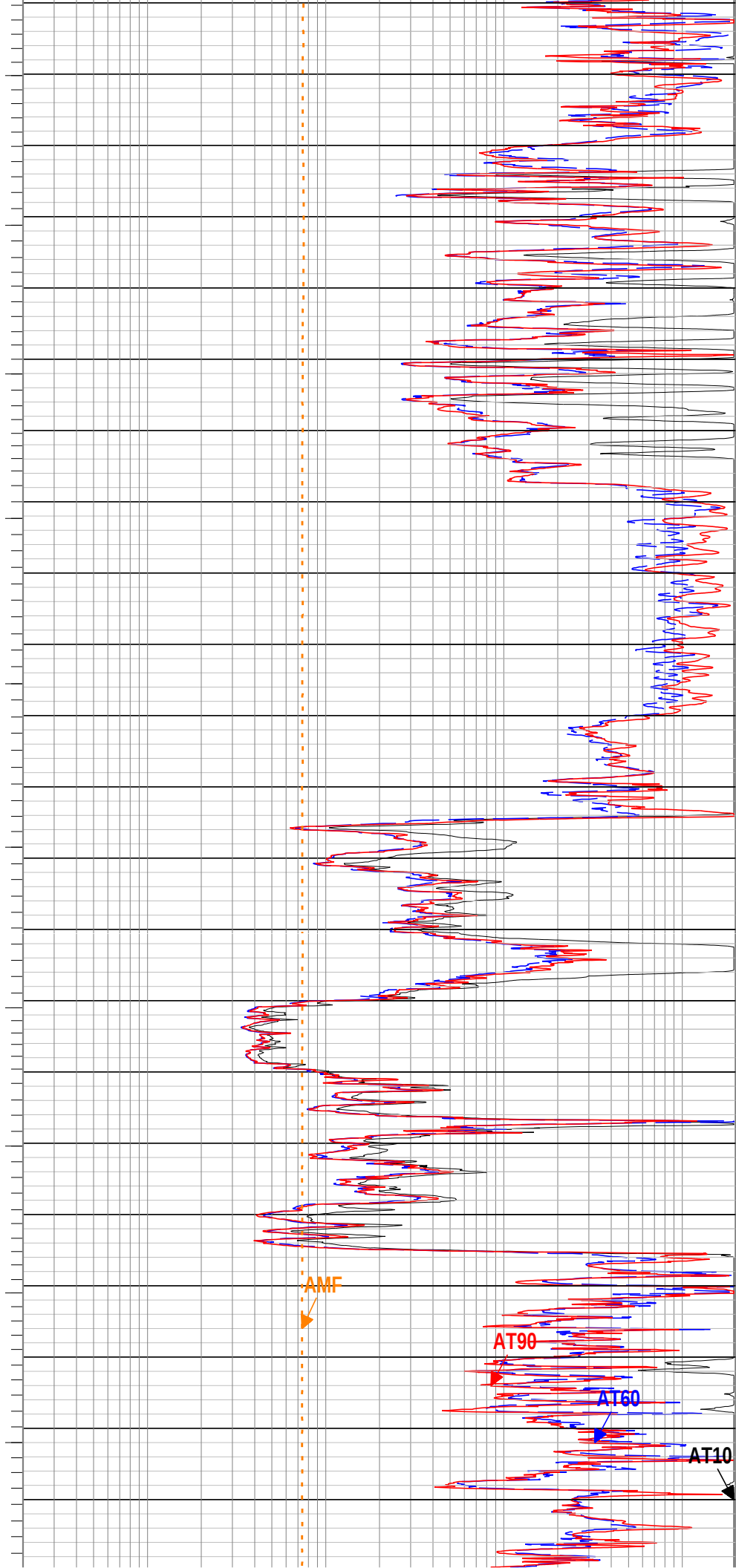
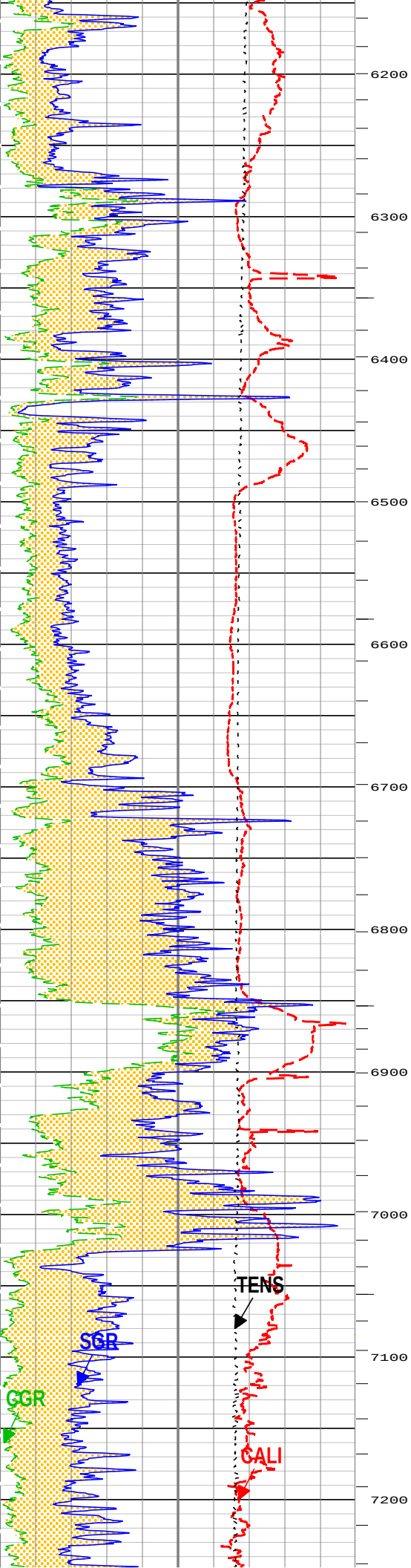
IHV - Integrated Hole Volume every 10.00 (#2)

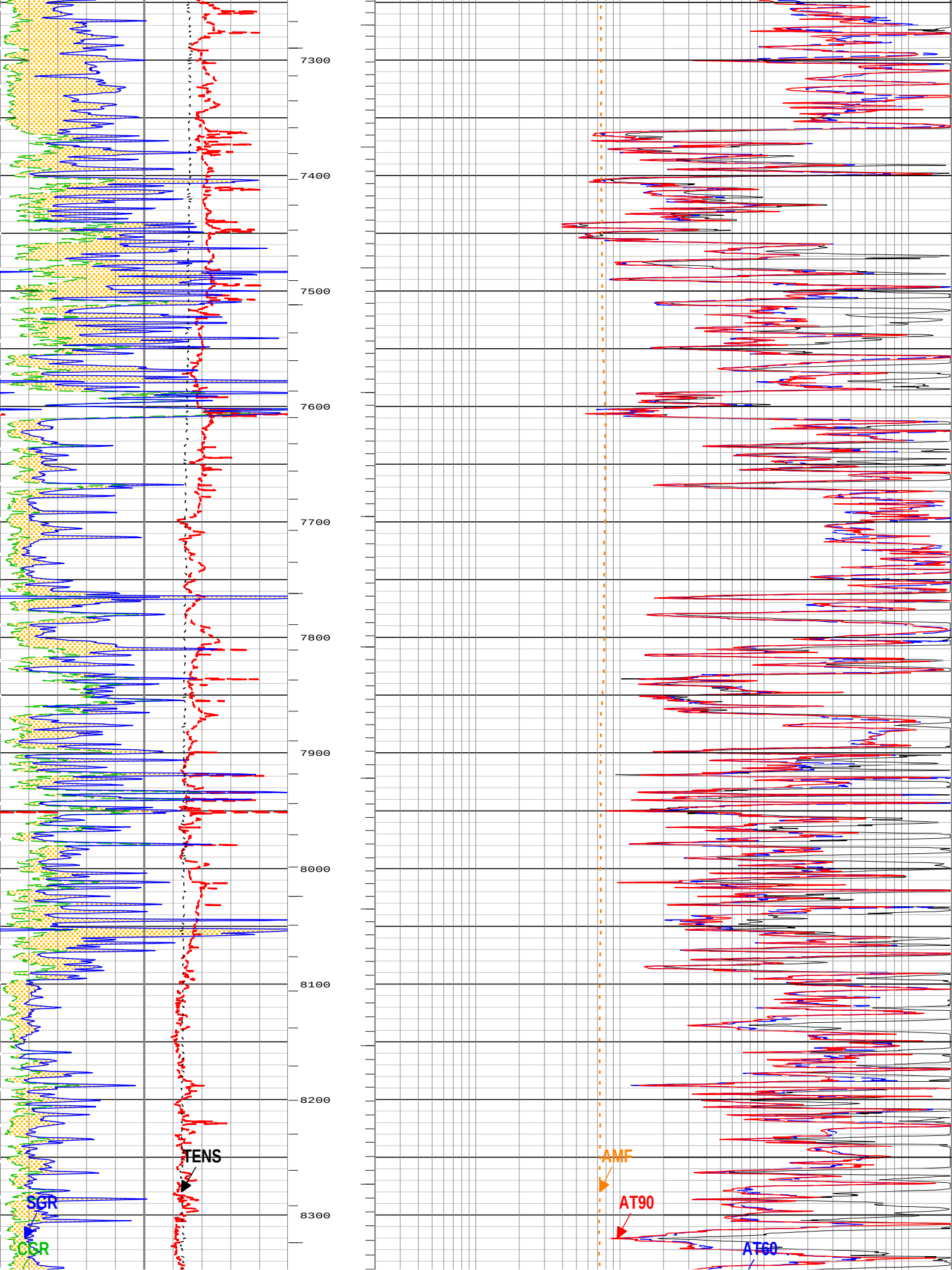
— IHV - Integrated Hole Volume every 10.00 (ft3)
— IHV - Integrated Hole Volume every 100.00 (ft3)
— ICV - Integrated Cement Volume every 10.00 (ft3)
— ICV - Integrated Cement Volume every 100.00 (ft3)

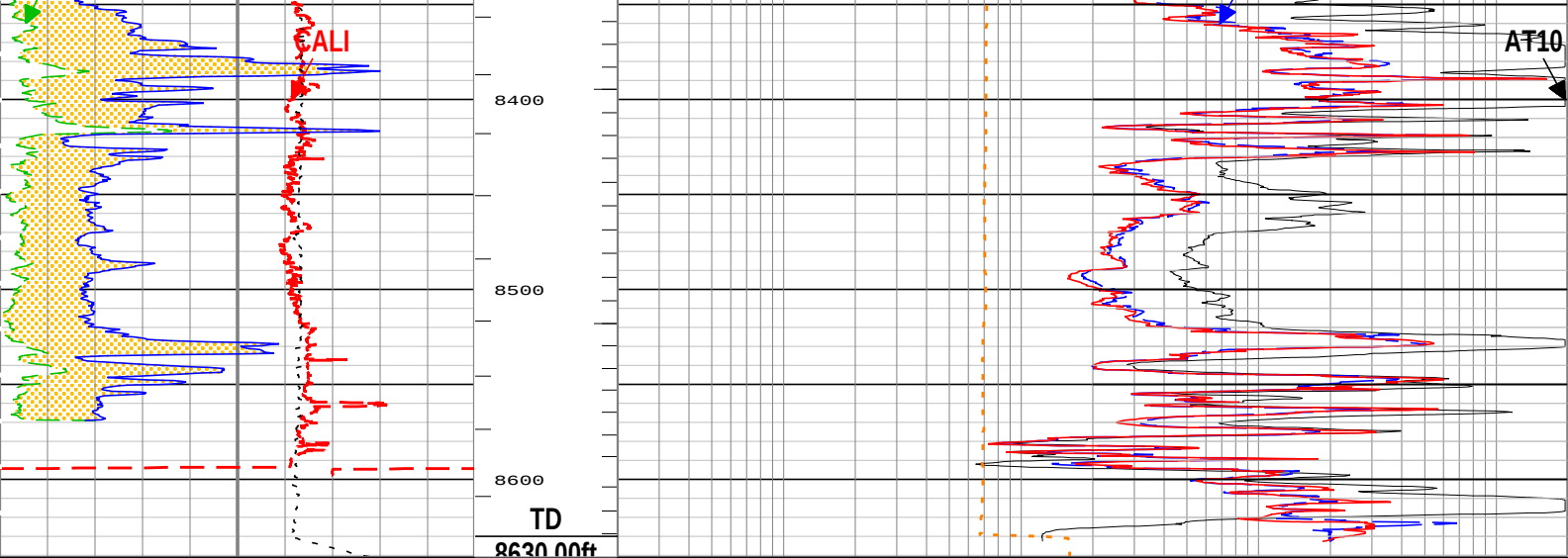












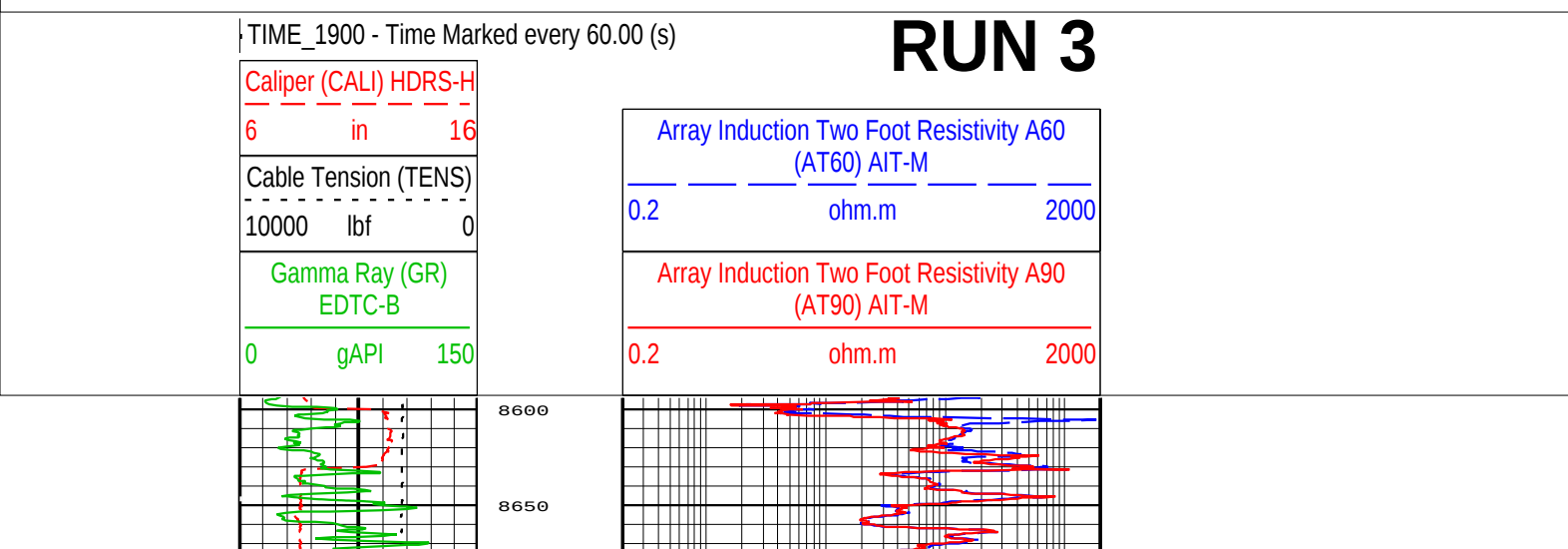
Uranium Indicator		
Caliper (CALI) HDRS-B		
6	in	16
Gamma Ray Contribution from Thorium and Potassium (CGR) HNGS-BA		
0	gAPI	100
Spectroscopy Gamma Ray (SGR) HNGS-BA		
0	gAPI	100
Cable Tension (TENS)		
10000	lbf	0

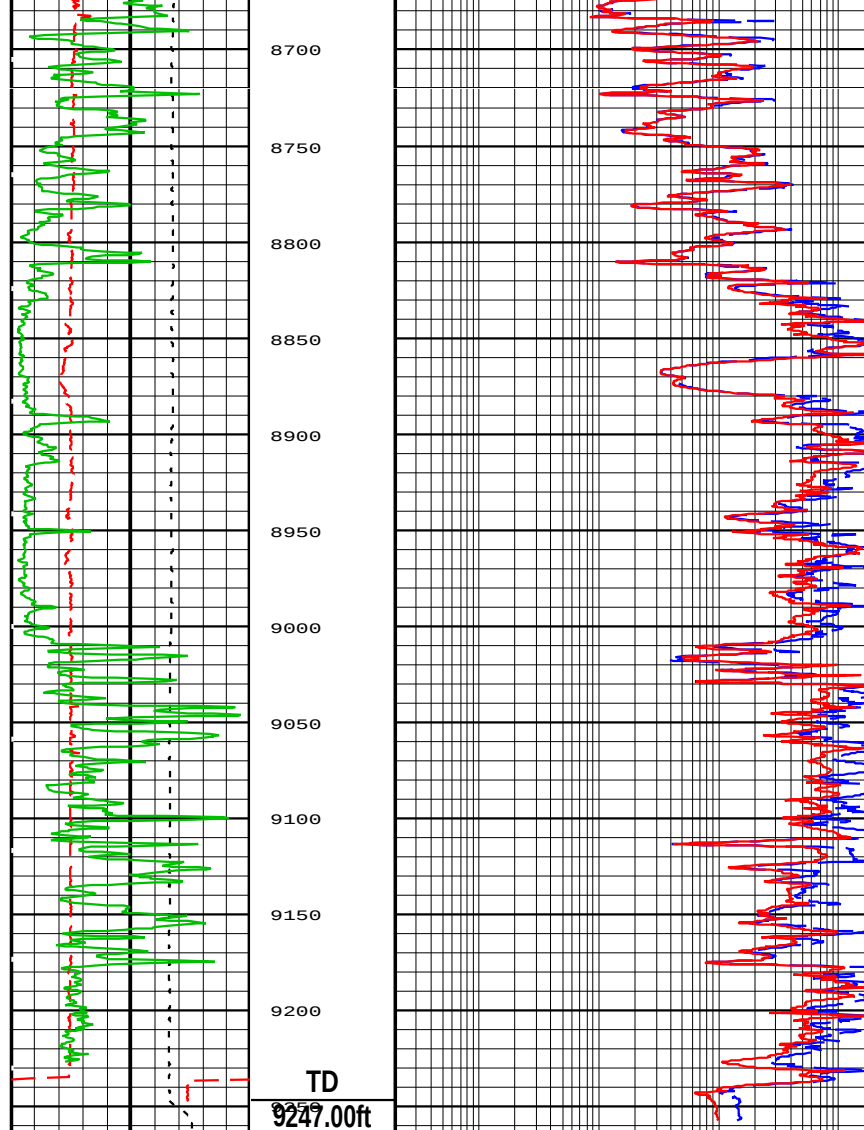
Array Induction Two Foot Resistivity A10 (AT10) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A60 (AT60) AIT-M		
0.2	ohm.m	2000
Array Induction Two Foot Resistivity A90 (AT90) AIT-M		
0.2	ohm.m	2000
Array Induction Mud Resistivity Fully Calibrated (AMF) AIT-M		
0.02	ohm.m	200

- ICV - Integrated Cement Volume every 100.00 (ft3)
- ICV - Integrated Cement Volume every 10.00 (ft3)
- IHV - Integrated Hole Volume every 100.00 (ft3)
- IHV - Integrated Hole Volume every 10.00 (ft3)
- TIME_1900 - Time Marked every 60.00 (s)

Description: AIT Basic Log Two Format: Log (Log (AIT_1_Inch)) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 30-Nov-2014 17:11:13

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
ABHM	Array Induction Borehole Correction Mode	AIT-M	Compute Standoff	
ACDE	Array Induction Casing Detection Enable	AIT-M	No	
ASTA	Array Induction Tool Standoff	AIT-M	1.625	in
BARI	Barite Mud Presence Flag	Borehole	No	
BHK	Drilling Fluid Potassium Concentration	Borehole	0	%
BHS	Borehole Status (Open or Cased Hole)	Borehole	Depth Zoned	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-B	0.168	in
CBLO	Casing Bottom (Logger)	WLSESSION	3219.5	ft
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	Depth Zoned	in
DBCC	Barite Constant Correction Flag	HNGS-BA	None	
DFD	Drilling Fluid Density	Borehole	8.8	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	9.625	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	





Caliper (CALI) HDRS-H	Array Induction Two Foot Resistivity A60 (AT60) AIT-M
6 in 16	0.2 ohm.m 2000
Cable Tension (TENS)	Array Induction Two Foot Resistivity A90 (AT90) AIT-M
10000 lbf 0	0.2 ohm.m 2000
Gamma Ray (GR) EDTC-B	
0 gAPI 150	

TIME_1900 - Time Marked every 60.00 (s)

Description: HRLT BASIC LOG Format: Log (HRLA_1_inch) Index Scale: 1 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 10-Dec-2014 09:15:28

Company:

Well:

Field:

County:

State:

PB ENERGY STORAGE SERVICES, INC

DCP LINAM RANCH AGI #2

AGI; BONE SPRING-WOLFCAMP

LEA

NEW MEXICO



Resistivity

