

Company: Anadarko E&P Onshore LLC

Well: Murphy 1-31 M

Field: Greenwood

County: Morton State: Kansas

HOLE AND CEMENT VOLUME			
GAMMA RAY			
FUTURE CASING SIZE = 5.5"			
County: Morton Field: Greenwood Well: Murphy 1-31 M Company: Anadarko E&P Onshore LLC	Location:		
	497.46' FEL & 1335.13' FSL SW,SE,NE,SW SE/4 SEC.31, T32S-R42W	Elev. K.B. G.L. D.F.	3538.19 ft 3545.19 ft
	Permanent Datum:	Mean Sea Level	Elev.: 0.00 ft
	Log Measured From:	Ground Level	3538.19 ft above Perm.Datum
Logging Date	Drilling Measured From:	Ground Level	
	API Serial No. 15-129-21957	Section: 31	Township: 32S Range: 42W
Run Number	12-Dec-2013		

Logging Date	12-Dec-2013				
Run Number	One				
Depth Driller	5250.00 ft				
Schlumberger Depth	5255.00 ft				
Bottom Log Interval	5255.00 ft				
Top Log Interval	1494.00 ft				
Casing Driller Size @ Depth	8.625 in @ 1480.00 ft				
Casing Schlumberger	1494 ft				
Bit Size	7.875 in				
Type Fluid In Hole	Fresh Water				
MUD	Density	Viscosity	60 s		
	Fluid Loss	PH	10.5		
	Source of Sample				
	RM @ Meas Temp	0.72 ohm.m @ 55 degF			
RMF @ Meas Temp	0.62 ohm.m @ 55 degF				
RMC @ Meas Temp	1.01 ohm.m @ 55 degF				
Source RMF	RMC	Calculated	Calculated		
RM @ BHT	RMF @ BHT	0.34 @ 123.4	0.29 @ 123.4		
Max Recorded Temperatures			123.4 degF 123		
Circulation Stopped	Time	12-Dec-2013	07:15:00		
Logger on Bottom	Time	12-Dec-2013	12:02:29		
Unit Number	Location:	2367	Elk City, OK		
Recorded By	Matt Cramer				
Witnessed By	Tom Bingel				

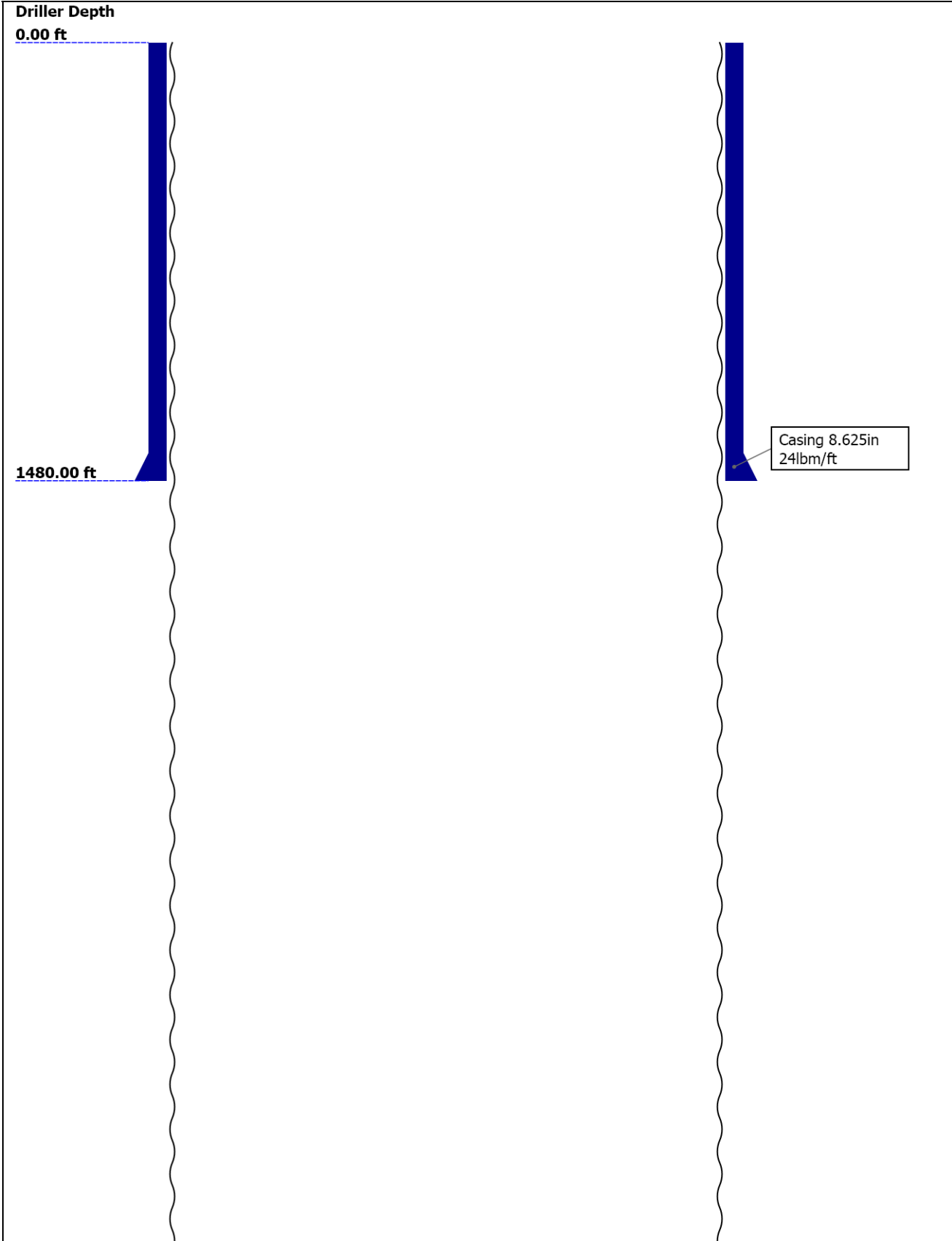
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Well Sketch



5250.00 ft

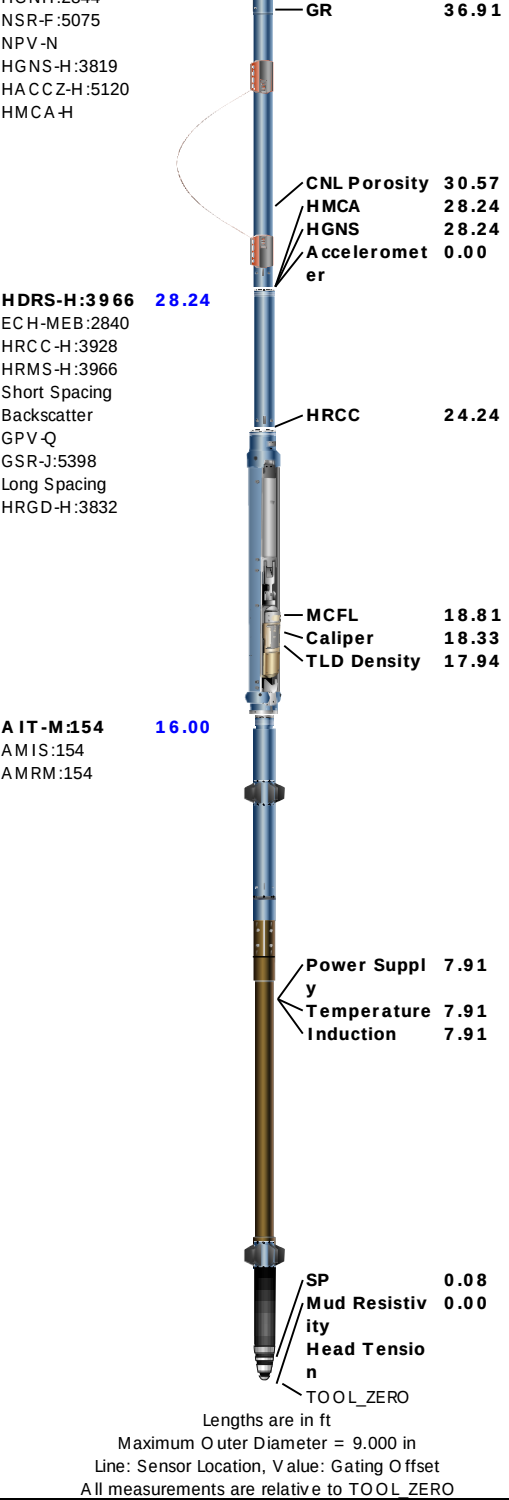
Open Hole 7.875in

Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	7.875					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	5250					
Bottom Logger (ft)	5255					
Casing						
Size (in)	8.625					
Weight (lbm/ft)	24					
Inner Diameter (in)	8.099					
Grade	J55					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	1480					
Bottom Logger (ft)	1494					

Remarks and Equipment Summary

One: Toolstring				One: Remarks
Equip name LEH-QT LEH-QT	Length 58.76	MP name	Offset	Thank you for choosing Schlumberger of Elk City, OK- 580-339-6535
				Tools ran as per toolsketch.
				All logs and presentations as per client's request.
				Logging measured from ground level as per client's request. Drilling measured from drill floor at 7' above ground level.
				Logged on limestone matrix (MDEN=2.56,DTM=47.6)
HNGS-BA:328 HEH-K:328 HNGS-BA:328	49.34			Standoff correction & Hole size correction were applied.
				Caliper check inside casing within tolerance.
				Source of maximum recorded temperature is HNGS temperature sensor.
HNGC-B:596 HNGH-A:4077 HNGC-B:596	41.15			
HGNS-H:3819 HGNH:2844	37.65			



Depth Summary

Depth Control Parameters	One		
Conveyance Type	Wireline		
Log Sequence	ONE		
Depth Remark Parameters	One		
Depth Remark 1	First run in hole, All Schlumberger Depth control procedures were followed.		
Depth Remark 2	IDW used as primary depth control & Z-Chart used as secondary.		
Depth Remark 3	Main Log was correlated to the Down log.		
Depth Remark 4	Logging measured from ground level as per client's request. Drilling measured from drill floor at 7' above ground level.		
Depth Measuring Device	One		

Type	IDW-JA		
Serial Number	6650		
Calibration Date	25-Apr-2013		
Calibrator Serial Number	33		
Calibration Cable Type	7-39P-LXS		
Wheel Correction 1	-6		
Wheel Correction 2	-3		
Tension Device	One		
Type	CMTD-B/A		
Serial Number	2549		
Calibration Date	25-Sep-2013		
Calibrator Serial Number	1018		
Calibration Points	10		
Calibration RMS	12		
Calibration Peak Error	19		
Logging Cable	One		
Type	7-39P-LXS		
Serial Number	U712016		
Logging Cable Length (ft)	16100.00		

One

Hole Profile and Cement Volume

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
IHV	Integrated Hole Volume	GCSE_UP_PASS	1355.1	ft3
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	732.39	ft3

Software Version

Acquisition System	Version
MaxWell	3.1.9755.0
Application Patch	SP-20130325-3.1.9755.1799

Computation	Description	Version
Borehole	Borehole Ensemble provides common Borehole Parameters and Channels	3.1.9755.1799

Tool Elements	Description	Software Version	Firmware Version
HRCC-H	HILT High-Resolution Control Cartridge, 150 degC	3.1.9755.0	2.0
HGNS-H	HILT Gamma-Ray and Neutron Sonde, 150 degC	3.1.9755.0	2.0

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
One	Log[4]:Up	Up	256.43 ft	5269.80 ft	12-Dec-2013 12:17:33 PM	12-Dec-2013 2:41:47 PM	9.93 ft	

All depths are referenced to toolstring zero

Log

One: Log[4]:Up

Description: Format: Log (Hole Profile 2 inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-Dec-2013 15:40

Channel	Source	Sampling
BS	Borehole	6in
CALI	HDRS-H:HRCC-H:HRCC-H	1in
GR	HGNS-H:HGNS-H:HGNS-H	6in
ICV	Borehole	6in
IHV	Borehole	6in

Borehole
TENS WLWorkflow 6in
TIME_1900 WLWorkflow 0.1in

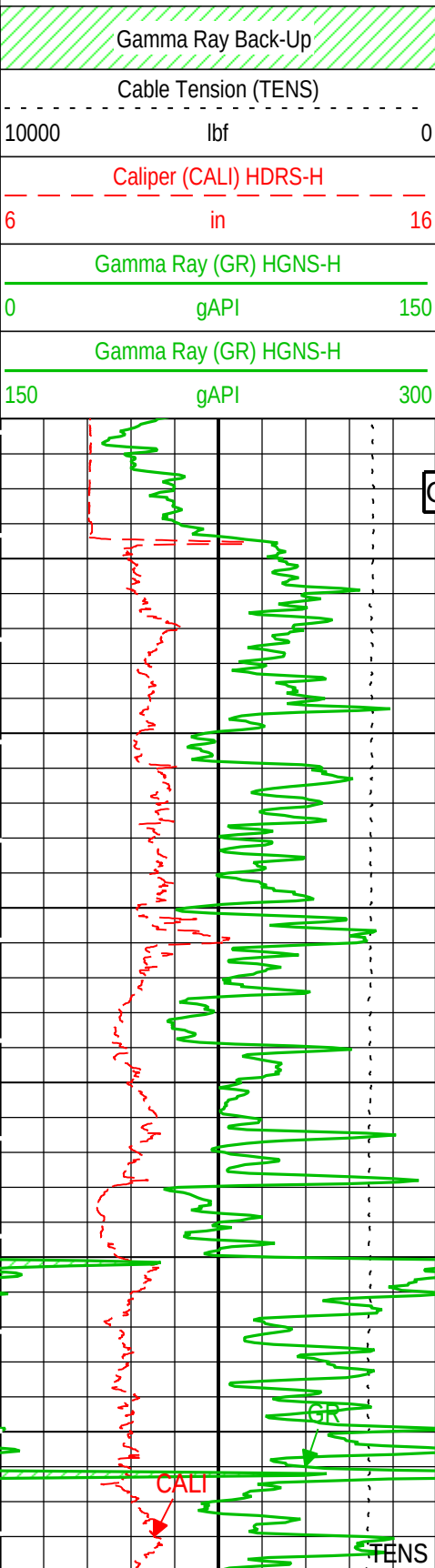
TIME_1900 - Time Marked every 60.00 (s)

— IHV - Integrated Hole Volume every 10.00 (ft3)

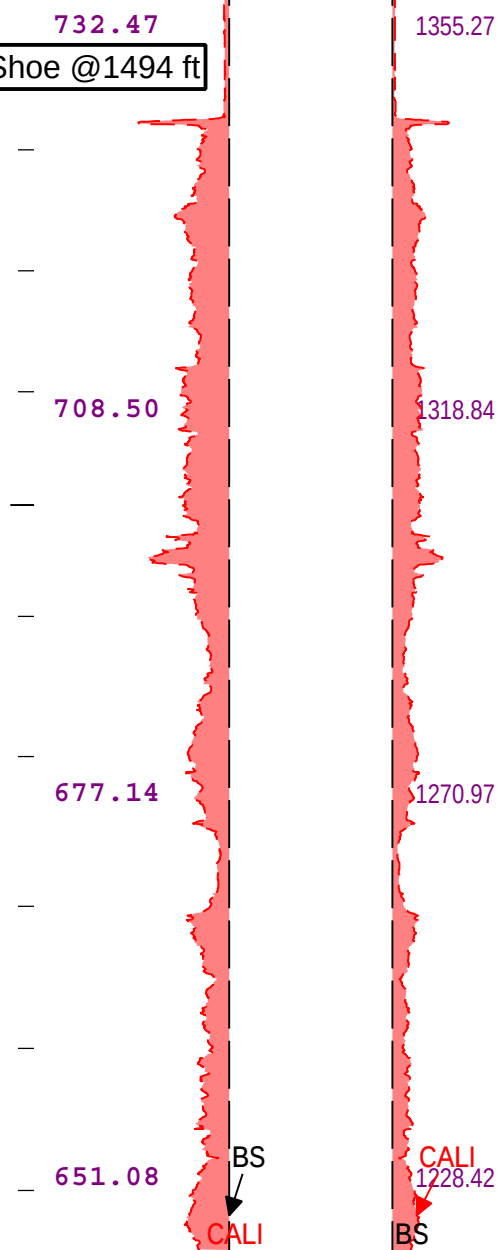
— ICV - Integrated Cement Volume every 10.00 (ft3)

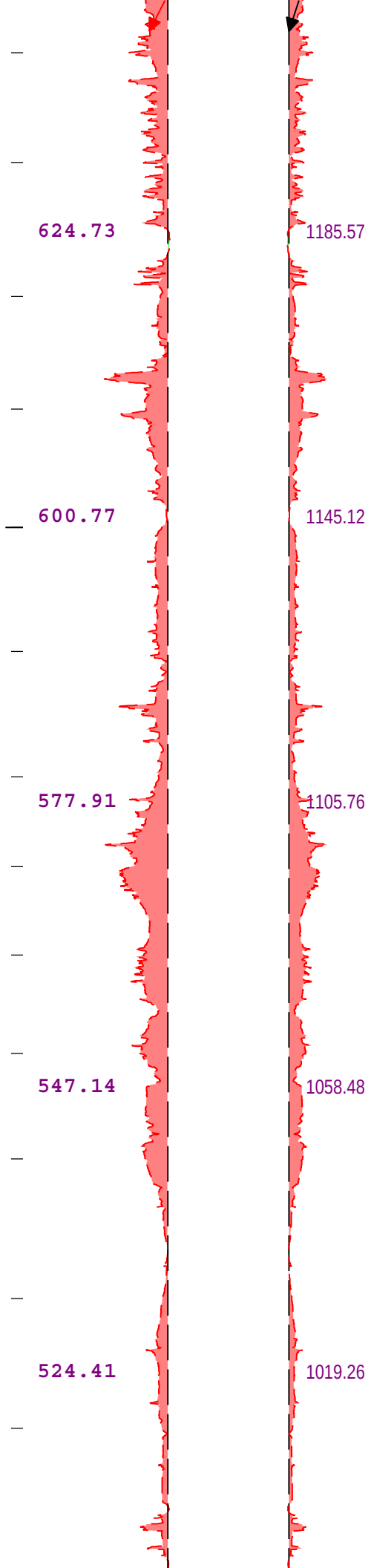
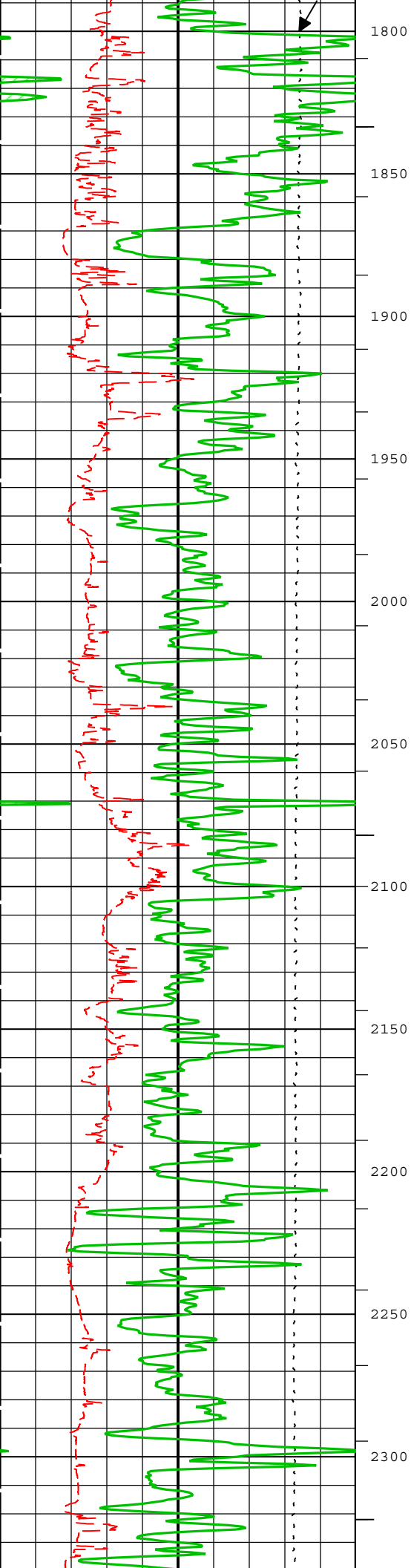
— ICV - Integrated Cement Volume every 100.00 (ft3)

— IHV - Integrated Hole Volume every 100.00 (ft3)



Washout	Washout
Mudcake	Mudcake
Integrated Cement Volume (ICV) ft3	Integrated Hole Volume (IHV) ft3
Caliper (CALI) HDRS-H	Bit Size (BS)
16 in 6	0 in 16
Bit Size (BS)	Caliper (CALI) HDRS-H
16 in 6	0 in 16





624.73

1185.57

600.77

1145.12

577.91

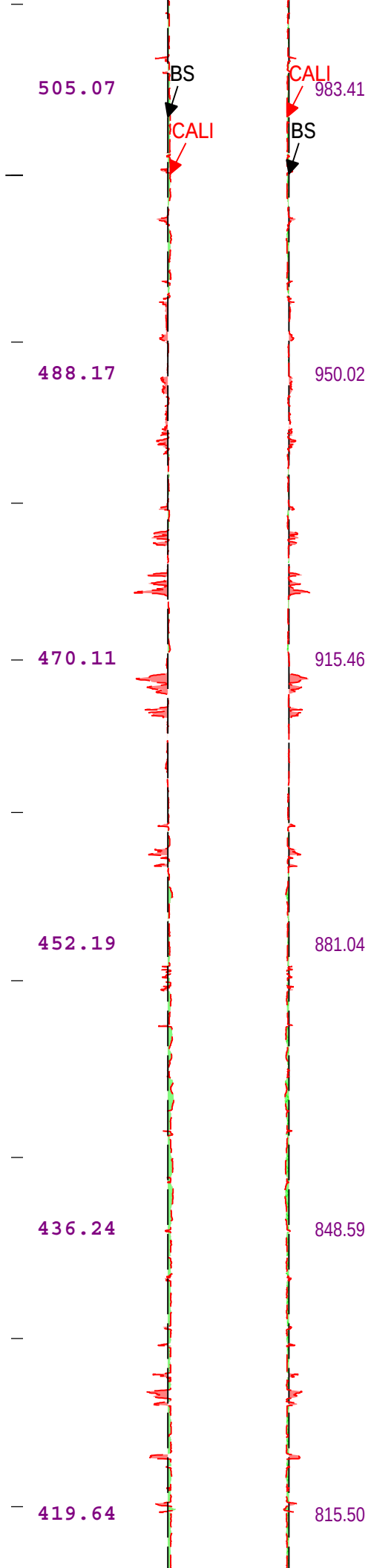
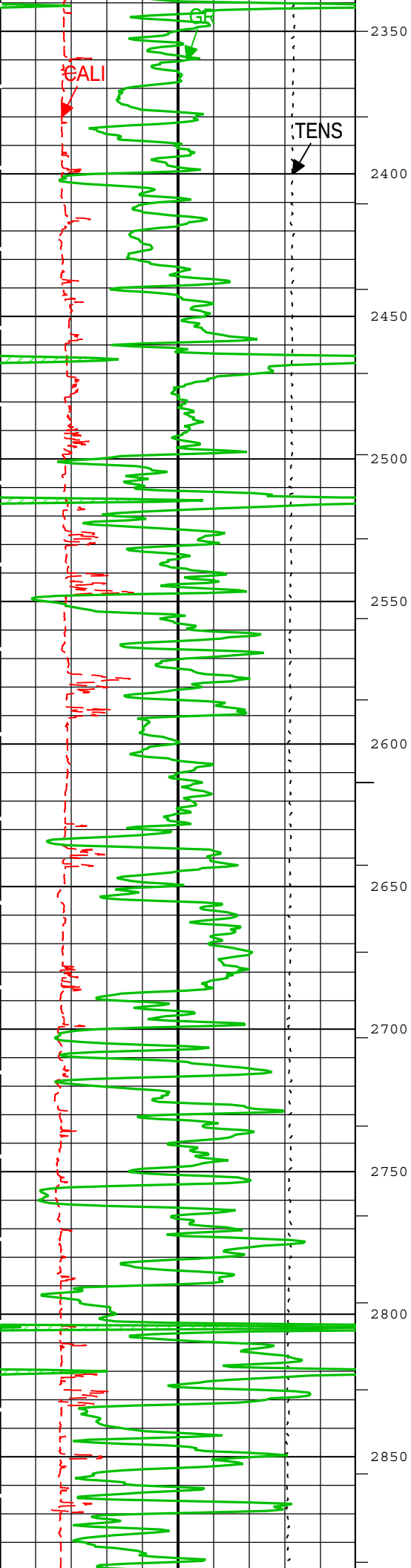
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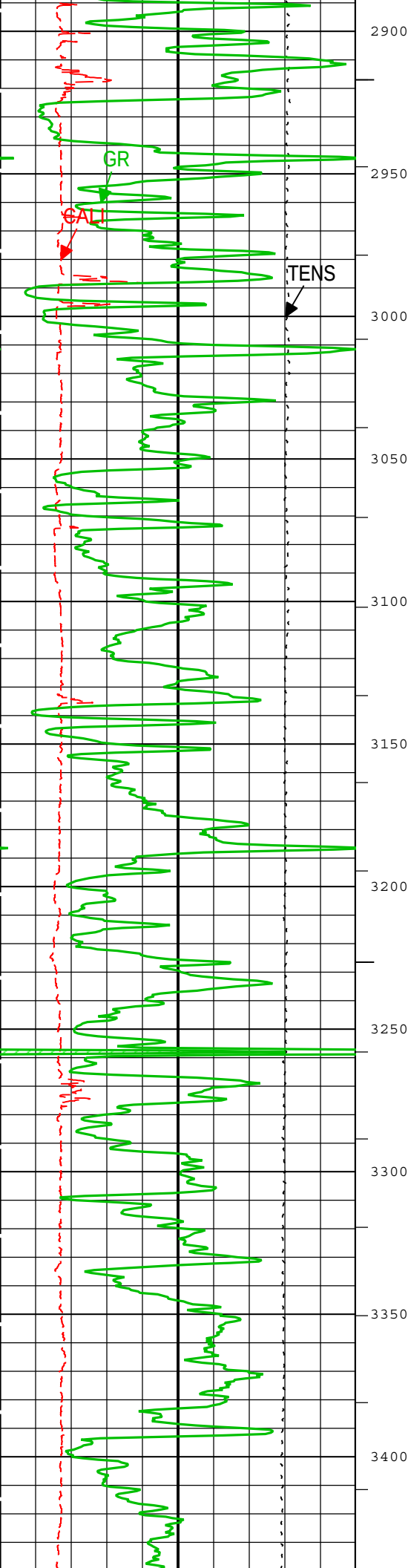
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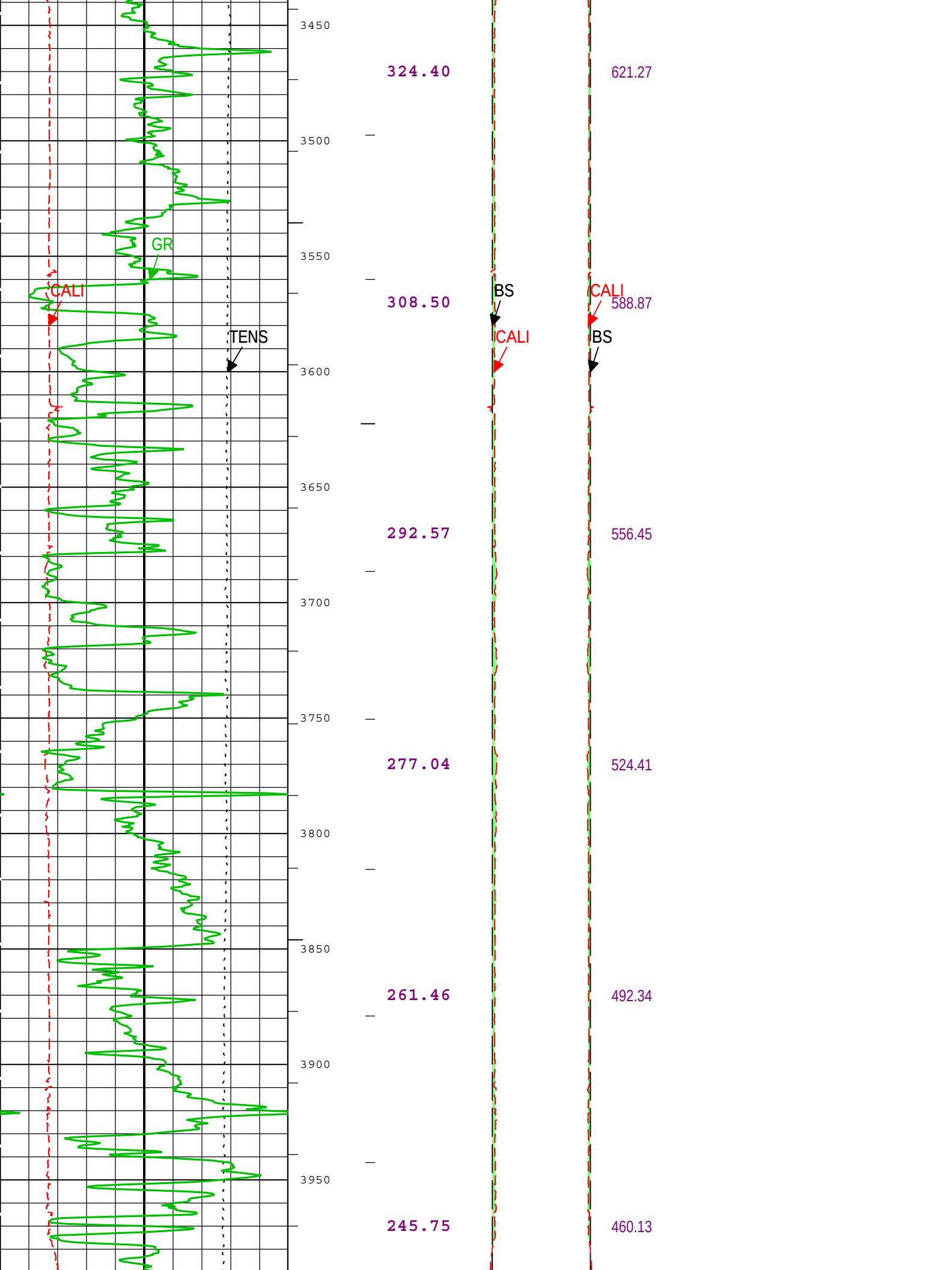
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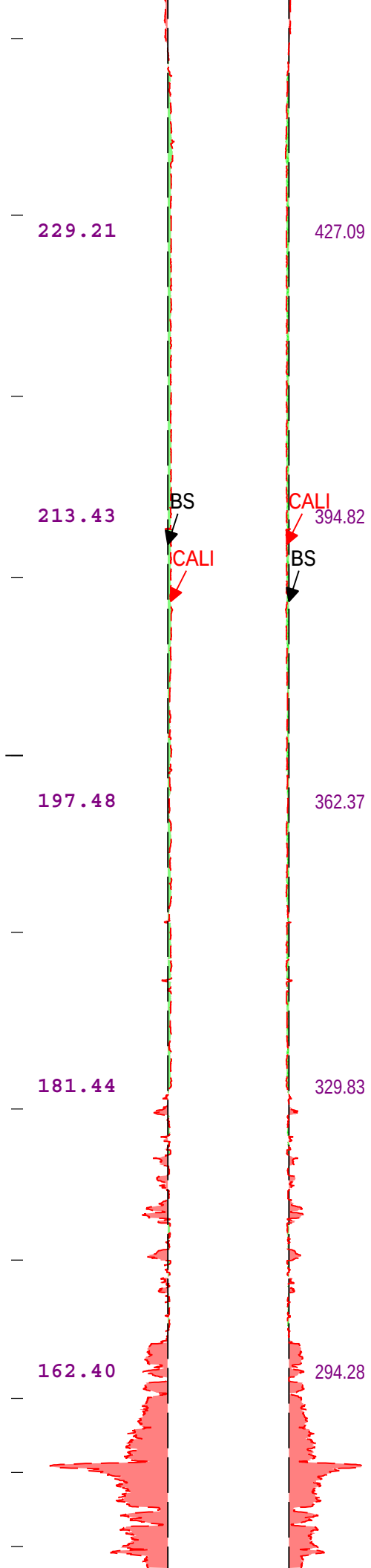
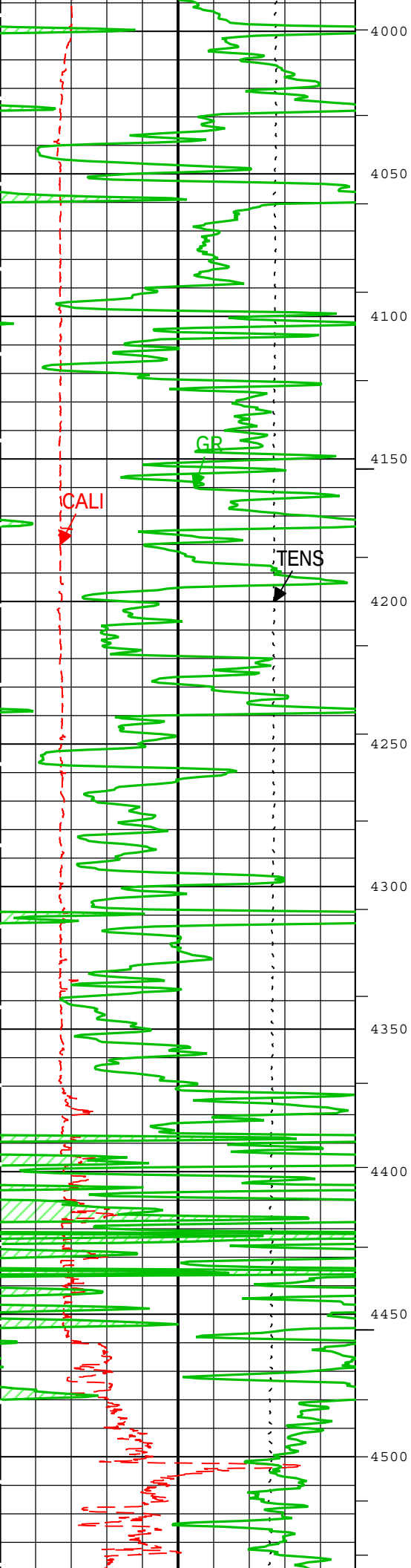
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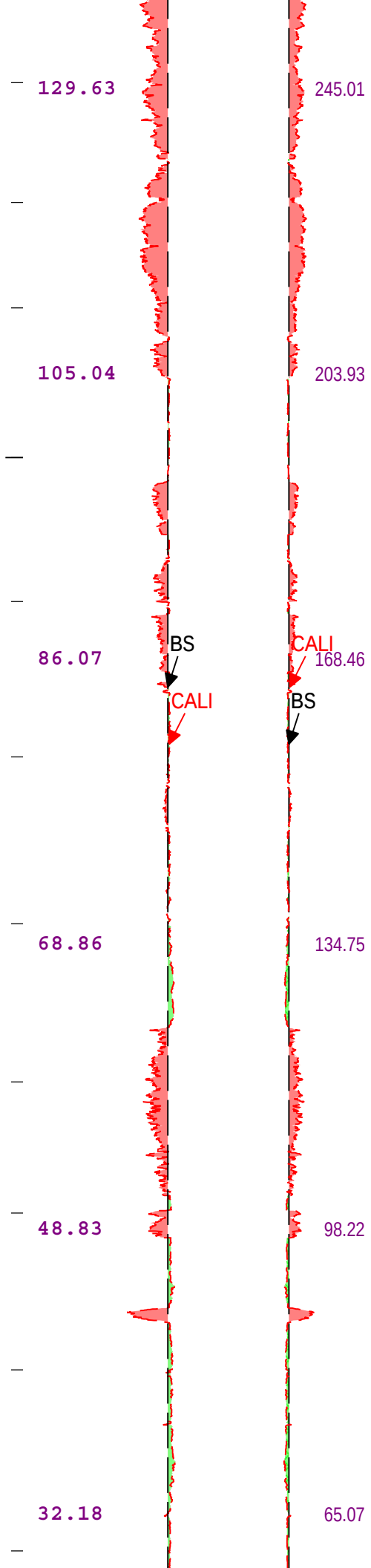
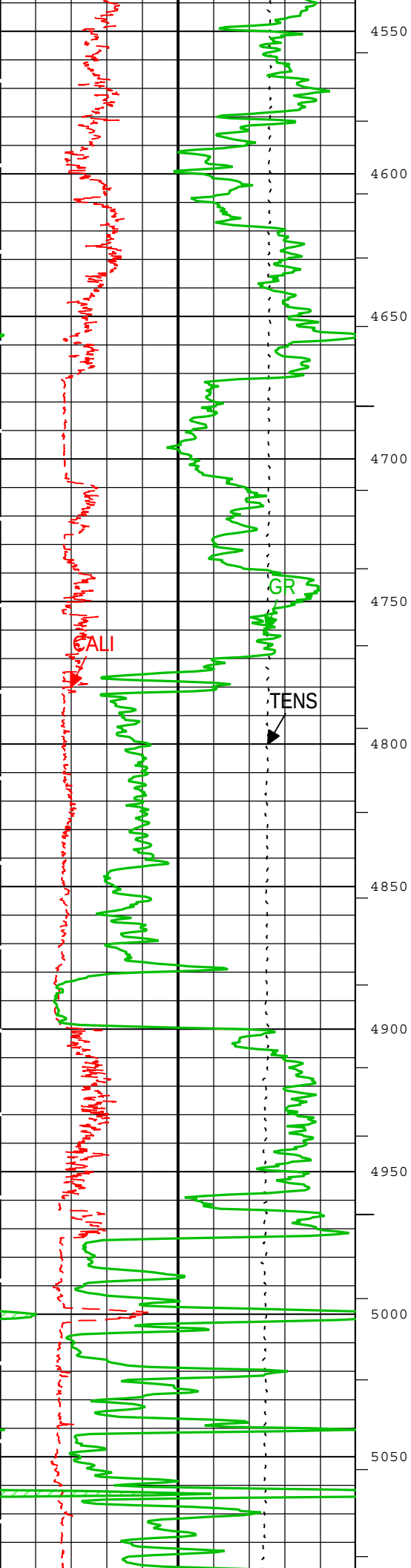
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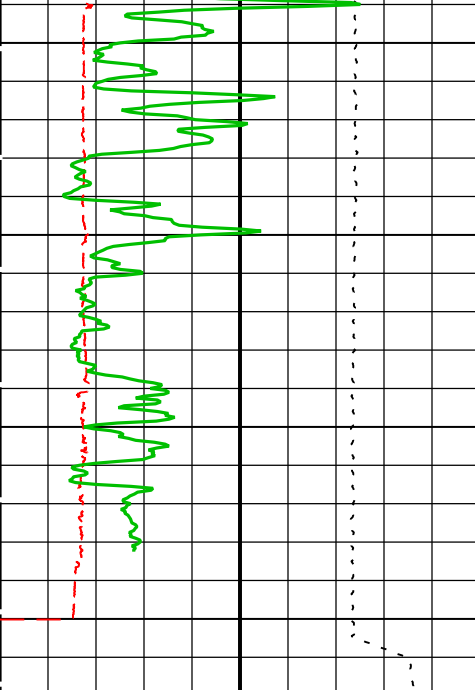












5100

5150

5200

5255

15.95

32.34

Total Depth @5255 ft

Gamma Ray Back-Up		
Cable Tension (TENS)		
10000	lbf	0
Caliper (CALI) HDRS-H		
6	in	16
Gamma Ray (GR) HGNS-H		
0	gAPI	150
Gamma Ray (GR) HGNS-H		
150	gAPI	300

Washout	Washout
Mudcake	Mudcake
Integrated Cement Volume (ICV) ft3	Integrated Hole Volume (IHV) ft3
Caliper (CALI) HDRS-H 16 in 6	Bit Size (BS) 0 in 16
Bit Size (BS) 16 in 6	Caliper (CALI) HDRS-H 0 in 16

— IHV - Integrated Hole Volume every 100.00 (ft3)

— ICV - Integrated Cement Volume every 100.00 (ft3)

— ICV - Integrated Cement Volume every 10.00 (ft3)

— IHV - Integrated Hole Volume every 10.00 (ft3)

TIME_1900 - Time Marked every 60.00 (s)

Description: Format: Log (Hole Profile 2 inch) Index Scale: 2 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 12-Dec-2013 15:40

Channel Processing Parameters				
Parameter	Description	Tool	Value	Unit
BARI	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	7.875	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	0	in
CBLO	Casing Bottom (Logger)	WLSESSION	1494	ft
CDEN	Cement Density	HGNS-H	2	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	8.625	in
DFD	Drilling Fluid Density	Borehole	8.8	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	5.5	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	
SOCO	Standoff Correction Option	HGNS-H	Yes	

Tool Control Parameters

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

Calibration Report

AIT-M (Array Induction Tool - M) Calibration - Run One

Primary Equipment :

Array Induction Sonde - M

AMIS

154

Auxiliary Equipment :

AITM Rm/SP Bottom Nose

AMRM

154

AIT Sonde Calibration - Test Loop Gain

Master (EEPROM): 13:53:29 16-Oct-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Test Loop Gain - 0		Master	1.000	0.950	1.016	1.050	
Test Loop Phase - 0	deg	Master	0	-3.000	0.598	3.000	
Test Loop Gain - 1		Master	1.000	0.950	1.017	1.050	
Test Loop Phase - 1	deg	Master	0	-3.000	0.750	3.000	
Test Loop Gain - 2		Master	1.000	0.950	1.013	1.050	
Test Loop Phase - 2	deg	Master	0	-3.000	0.051	3.000	
Test Loop Gain - 3		Master	1.000	0.950	1.007	1.050	
Test Loop Phase - 3	deg	Master	0	-3.000	0.149	3.000	
Test Loop Gain - 4		Master	1.000	0.950	0.992	1.050	
Test Loop Phase - 4	deg	Master	0	-3.000	0.095	3.000	
Test Loop Gain - 5		Master	1.000	0.950	0.983	1.050	
Test Loop Phase - 5	deg	Master	0	-3.000	-0.119	3.000	
Test Loop Gain - 6		Master	1.000	0.950	0.993	1.050	
Test Loop Phase - 6	deg	Master	0	-3.000	0.290	3.000	
Test Loop Gain - 7		Master	1.000	0.950	1.008	1.050	
Test Loop Phase - 7	deg	Master	0	-3.000	-0.060	3.000	

AIT Sonde Calibration - Sonde Error Correction

Master (EEPROM): 13:53:29 16-Oct-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Sonde Error Correction Real - 0	mS/m	Master	-----	-231.000	-102.514	119.000	
Sonde Error Correction Quad - 0		Master	-----	-2250.000	-165.193	2250.000	
Sonde Error Correction Real - 1	mS/m	Master	-----	114.000	152.862	204.000	
Sonde Error Correction Quad - 1		Master	-----	-625.000	156.352	625.000	
Sonde Error Correction Real - 2	mS/m	Master	-----	66.000	105.127	156.000	
Sonde Error Correction Quad - 2		Master	-----	-350.000	-67.600	350.000	
Sonde Error Correction Real - 3	mS/m	Master	-----	39.000	58.910	89.000	
Sonde Error Correction Quad - 3		Master	-----	-250.000	92.322	250.000	
Sonde Error Correction Real - 4	mS/m	Master	-----	15.000	24.933	35.000	
Sonde Error Correction Quad - 4		Master	-----	-63.000	47.414	63.000	
Sonde Error Correction Real - 5	mS/m	Master	-----	4.000	12.207	24.000	
Sonde Error Correction Quad - 5		Master	-----	-50.000	-25.021	50.000	
Sonde Error Correction Real - 6	mS/m	Master	-----	5.000	9.503	15.000	
Sonde Error Correction Quad - 6		Master	-----	-30.000	0.642	30.000	
Sonde Error Correction Real - 7	mS/m	Master	-----	-5.000	-1.991	5.000	
Sonde Error Correction Quad - 7		Master	-----	-30.000	-0.082	30.000	

AIT Mud Calibration - Mud Calibration Gain

Master (EEPROM): 13:53:29 16-Oct-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Coarse Gain		Master	1.000	0.800	1.023	1.200	
Fine Gain		Master	1.000	0.800	1.023	1.200	

AIT Electronics Check - Thru Calibration Check

Master (EEPROM): 13:53:29 16-Oct-2013 Before (Measured): 21:00:04 03-Feb-2014 After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Thru Cal Mag - 0	V	Master	-----	0.366	0.597	0.854	
		Before	-----	0.366	0.596	0.854	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-0.001	-----	
		After-Before	-----	-----	-----	-----	

Thru Cal Phase - 0	deg	Master	----	137.000	-170.441	-103.000	
		Before	----	137.000	-164.390	-103.000	
		After	----	----	----	----	
		Before-Master	----	----	6.051	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 1	V	Master	----	0.762	1.222	1.778	
		Before	----	0.762	1.222	1.778	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 1	deg	Master	----	136.000	-171.517	-104.000	
		Before	----	136.000	-165.460	-104.000	
		After	----	----	----	----	
		Before-Master	----	----	6.057	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 2	V	Master	----	0.372	0.607	0.868	
		Before	----	0.372	0.606	0.868	
		After	----	----	----	----	
		Before-Master	----	----	-0.001	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 2	deg	Master	----	132.000	-175.054	-108.000	
		Before	----	132.000	-169.001	-108.000	
		After	----	----	----	----	
		Before-Master	----	----	6.053	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 3	V	Master	----	0.420	0.684	0.980	
		Before	----	0.420	0.684	0.980	
		After	----	----	----	----	
		Before-Master	----	----	0.000	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 3	deg	Master	----	131.000	-175.807	-109.000	
		Before	----	131.000	-169.753	-109.000	
		After	----	----	----	----	
		Before-Master	----	----	6.054	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 4	V	Master	----	0.804	1.280	1.876	
		Before	----	0.804	1.279	1.876	
		After	----	----	----	----	
		Before-Master	----	----	-0.001	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 4	deg	Master	----	125.000	178.088	-115.000	
		Before	----	125.000	-175.853	-115.000	
		After	----	----	----	----	
		Before-Master	----	----	-353.941	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 5	V	Master	----	1.176	1.864	2.744	
		Before	----	1.176	1.863	2.744	
		After	----	----	----	----	
		Before-Master	----	----	-0.001	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 5	deg	Master	----	122.000	176.493	-118.000	
		Before	----	122.000	-177.445	-118.000	
		After	----	----	----	----	
		Before-Master	----	----	-353.938	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 6	V	Master	----	1.176	1.865	2.744	
		Before	----	1.176	1.864	2.744	
		After	----	----	----	----	
		Before-Master	----	----	-0.001	----	
		After-Before	----	----	----	----	
Thru Cal Phase - 6	deg	Master	----	121.000	176.477	-119.000	
		Before	----	121.000	-177.461	-119.000	
		After	----	----	----	----	
		Before-Master	----	----	-353.938	----	
		After-Before	----	----	----	----	
Thru Cal Mag - 7	V	Master	----	0.846	1.340	1.974	
		Before	----	0.846	1.340	1.974	
		After	----	----	----	----	

		Before-Master After-Before	----- -----	----- -----	0.000 -----	----- -----	
Thru Cal Phase - 7	deg	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	115.000 115.000 ----- ----- -----	175.810 -178.098 ----- -353.908 -----	-125.000 -125.000 ----- ----- -----	
SPA Zero	mV	Master Before After Before-Master After-Before	 ----- ----- -----	-50.000 -50.000 ----- ----- -----	-0.427 -0.421 ----- 0.006 -----	50.000 50.000 ----- ----- -----	
SPA Plus	mV	Master Before After Before-Master After-Before	 ----- ----- -----	941.000 941.000 ----- ----- -----	991.321 991.149 ----- -0.172 -----	1040.000 1040.000 ----- ----- -----	
Temperature Zero	V	Master Before After Before-Master After-Before	 ----- ----- -----	-0.050 -0.050 ----- ----- -----	0.000 0.000 ----- 0.000 -----	0.050 0.050 ----- ----- -----	
Temperature Plus	V	Master Before After Before-Master After-Before	 ----- ----- -----	0.870 0.870 ----- ----- -----	0.918 0.918 ----- 0.000 -----	0.960 0.960 ----- ----- -----	

HDRS-H (HILT Density and Rxo Sonde, 150 degC) Calibration - Run One

Primary Equipment :		
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3928
HILT Resistivity Gamma-Ray Density Device, 150 degC	HRGD-H	3832
Auxiliary Equipment :		
HRDD Backscatter Detector	Backscatter	
HRDD Long Spacing Detector	Long Spacing	
HRDD Short Spacing Detector	Short Spacing	
Cesium 137 Gamma-Ray Logging Source	GSR-J	5398
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	3928
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	3966
Calibration Parameter :		
Small Ring Size (Caliper Calibration Small Ring)	8.00	
Large Ring Size (Caliper Calibration Large Ring)	12.00	

HDRS Caliper Calibration - Caliper Accumulations

Before (Measured):								14:20:14 05-Dec-2013 Expired by 5 days			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit					
Small Ring	in	Before	8.00	6.00	8.97	10.00					
Large Ring	in	Before	12.00	9.00	13.11	15.00					

HDRS Density Calibration - Inversion Results

Master (EEPROM):		11:31:16 04-Dec-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Rho Aluminum	g/cm3	Master	2.596	2.586	2.596	2.606	
Rho Magnesium	g/cm3	Master	1.686	1.676	1.688	1.696	
Pe Aluminum		Master	2.570	2.470	2.528	2.670	
Pe Magnesium		Master	2.650	2.550	2.646	2.750	

HDRS Density Calibration - Deviation Summary

Master (EEPROM):		11:31:16 04-Dec-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Average Deviation	%	Master	0	-0.6000	0.2377	0.6000	
BS Max Deviation	%	Master	0	-1.6000	0.4897	1.6000	
SS Average Deviation	%	Master	0	-1.0000	0.4242	1.0000	

SS Average Deviation	%	Master	0	-1.0000	0.4242	1.0000	
SS Max Deviation	%	Master	0	-2.5000	1.3410	2.5000	
LS Average Deviation	%	Master	0	-1.5000	0.7557	1.5000	
LS Max Deviation	%	Master	0	-3.5000	1.4046	3.5000	

HDRS Density Calibration - Background Summary

Master (EEPROM):		11:31:16 04-Dec-2013		Before (Measured):		11:44:43 05-Dec-2013 Expired by 5 days	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Window Ratio		Master	1.0000		0.7399		
		Before	0.7399	0.7029	0.7422	0.7769	
		Before-Master	-----	-----	0.0023	-----	
BS Window Sum	1/s	Master	1		22878		
		Before	22878	21734	22904	24022	
		Before-Master	-----	-----	26	-----	
SS Window Ratio		Master	1.0000		0.4864		
		Before	0.4864	0.4621	0.4838	0.5108	
		Before-Master	-----	-----	-0.0026	-----	
SS Window Sum	1/s	Master	1		10252		
		Before	10252	9739	10234	10764	
		Before-Master	-----	-----	-18	-----	
LS Window Ratio		Master	1.0000		0.2987		
		Before	0.2987	0.2838	0.2963	0.3137	
		Before-Master	-----	-----	-0.0024	-----	
LS Window Sum	1/s	Master	1		1154		
		Before	1154	1096	1147	1212	
		Before-Master	-----	-----	-7	-----	

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM):		11:31:16 04-Dec-2013		Before (Measured):		11:44:43 05-Dec-2013 Expired by 5 days	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS PM High Voltage	V	Master		1000	1374	2400	
		Before		1000	1381	2400	
		Before-Master	-----	-100	7	100	
SS PM High Voltage	V	Master		1000	1285	2400	
		Before		1000	1297	2400	
		Before-Master	-----	-100	12	100	
LS PM High Voltage	V	Master		1000	1316	2400	
		Before		1000	1324	2400	
		Before-Master	-----	-100	8	100	

HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM):		11:31:16 04-Dec-2013		Before (Measured):		11:44:43 05-Dec-2013 Expired by 5 days	
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
BS Crystal Resolution	%	Master		5.00	10.38	25.00	
		Before		5.00	10.41	25.00	
		Before-Master	-----	-1.00	0.03	1.00	
SS Crystal Resolution	%	Master		5.00	8.54	20.00	
		Before		5.00	8.56	20.00	
		Before-Master	-----	-1.00	0.02	1.00	
LS Crystal Resolution	%	Master		5.00	8.98	20.00	
		Before		5.00	8.89	20.00	
		Before-Master	-----	-1.00	-0.09	1.00	

HDRS MCFL Calibration - MCFL Accumulations

Before (Measured):		11:15:31 12-Dec-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Main Resistivity	ohm.m	Before	3875	3565	3868	4185	
Deep Resistivity	ohm.m	Before	3830	3524	3799	4136	
Shallow Resistivity	ohm.m	Before	3830	3524	3816	4136	

HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run One

Primary Equipment :			
HILT Gamma-Ray and Neutron Sonde, 150 degC		HGNS-H	3819
Auxiliary Equipment :			
HGNS Accelerometer, 150 degC		HACCZ-H	5120
AmBe Neutron Logging Source		NSR-F	5075

Calibration Parameter :							
Water Temperature							
Housing Size							
JIG-BKG (Jig minus background reference)				165			

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured):		11:16:03 12-Dec-2013					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	32.1	32.8	

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM):		00:00:00 15-May-2006					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Accelerometer Manufacturer		Master			QAT_160		
Accelerometer Reference Temperature	degF	Master		30.2	77.0	122.0	
Accelerometer Coefficients - 0		Master	----	----	519.600	----	
Accelerometer Coefficients - 1		Master	----	----	33.360	----	
Accelerometer Coefficients - 2		Master	----	----	-0.009	----	
Accelerometer Coefficients - 3		Master	----	----	0.000	----	
Accelerometer Coefficients - 4		Master	----	----	2.719	----	
Accelerometer Coefficients - 5		Master	----	----	0.000	----	
Accelerometer Coefficients - 6		Master	----	----	0.000	----	
Accelerometer Coefficients - 7		Master	----	----	0.000	----	
Accelerometer Coefficients - 8		Master	----	----	298.600	----	
Accelerometer Coefficients - 9		Master	----	----	0.997	----	

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM):		11:02:48 16-Oct-2013		Before (Measured):		14:56:08 05-Dec-2013		After:	
Expired by 5 days									
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit			
Near Zero Measurement	1/s	Master	0	5.0	26.3	40.0			
		Before	0	5.0	27.7	40.0			
		After	----	----	----	----			
		Before-Master	----	-3.9	1.4	3.9			
		After-Before	----	----	----	----			
Far Zero Measurement	1/s	Master	0	5.0	29.2	40.0			
		Before	0	5.0	28.1	40.0			
		After	----	----	----	----			
		Before-Master	----	-4.4	-1.1	4.4			
		After-Before	----	----	----	----			
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	5447.0	6900.0			
		Before	----	----	----	----			
		After	----	----	----	----			
		Before-Master	----	----	----	----			
		After-Before	----	----	----	----			
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2281.0	2900.0			
		Before	----	----	----	----			
		After	----	----	----	----			
		Before-Master	----	----	----	----			
		After-Before	----	----	----	----			
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	5553.0	6900.0			
		Before	----	----	----	----			
		After	----	----	----	----			
		Before-Master	----	----	----	----			
		After-Before	----	----	----	----			
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2338.0	2900.0			
		Before	----	----	----	----			
		After	----	----	----	----			
		Before-Master	----	----	----	----			
		After-Before	----	----	----	----			

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured):		14:53:52 05-Dec-2013 Expired by 5 days After:					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	22.6	120.0	
		After	----	----	----	----	

RGR Plus Measurement	gAPI	After-Before Before After After-Before	----- 185.4 ----- -----	----- 157.1 ----- -----	----- 176.1 NOT DONE -----	----- 206.3 ----- -----	
GR Calibration Gain		Before After After-Before	0.89 ----- -----	0.80 ----- -----	0.94 ----- -----	1.05 ----- -----	

HNGS-BA (Hostile-environment Natural Gamma-ray Sonde) Calibration - Run One			
Primary Equipment :			
HNGS Sonde Element	HNGS-BA	328	
Auxiliary Equipment :			
Hostile Natural Gamma Ray Cartridge	HNGC-B	596	
HNGS Housing Element	HEH-K	328	
		0	

HNGS Background and Na22 Set Point Determination - Detector 1 Check							
Master (EEPROM): 16:37:03 16-Nov-2013		Before:			After:		
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Location - 0		Master			39.685		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Na 511 Peak Resolution - 0	%	Master			14.671		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
High Voltage DAC Value - 0	V	Master			0.000		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Na 1785 Peak Location - 0		Master			142.226		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Na 1785 Peak Resolution - 0	%	Master			8.213		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Temperature - 0	degF	Master					
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Na Count Rate - 0	CPS	Master	45.000	10.000	24.611	100.000	
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

HNGS Background and Na22 Set Point Determination - Detector 2 Check							
Master (EEPROM): 16:37:03 16-Nov-2013		Before:			After:		
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Location - 0		Master			39.668		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	
Na 511 Peak Resolution - 0	%	Master			15.246		
		Before	-----	-----	-----	-----	
		After	-----	-----	-----	-----	
		Before-Master	-----	-----	-----	-----	
		After-Before	-----	-----	-----	-----	

		After Before-Master After-Before	----- ----- -----	----- ----- -----	----- ----- -----	----- ----- -----	<table><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>															
High Voltage DAC Value - 0	V	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	----- ----- ----- ----- -----	0.000 ----- ----- ----- -----	----- ----- ----- ----- -----	<table><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>															
Na 1785 Peak Location - 0		Master Before After Before-Master After-Before	----- ----- ----- ----- -----	----- ----- ----- ----- -----	141.964 ----- ----- ----- -----	----- ----- ----- ----- -----	<table><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>															
Na 1785 Peak Resolution - 0	%	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	----- ----- ----- ----- -----	8.671 ----- ----- ----- -----	----- ----- ----- ----- -----	<table><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>															
Temperature - 0	degF	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	----- ----- ----- ----- -----	----- ----- ----- ----- -----	----- ----- ----- ----- -----	<table><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>															
Na Count Rate - 0	CPS	Master Before After Before-Master After-Before	45.000 ----- ----- ----- -----	10.000 ----- ----- ----- -----	24.616 ----- ----- ----- -----	100.000 ----- ----- ----- -----	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															

HNGS Background and Na22 Set Point Determination - Ratio of Detector 1 to Detector 2

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<table><tr><td></td><td></td></tr></table>		
Coincidence Count Rate Ratio - 0		Master			0.000		<table><tr><td></td><td></td></tr></table>		
		Before	----	----	----	----	<table><tr><td></td><td></td></tr></table>		
		After	----	----	----	----	<table><tr><td></td><td></td></tr></table>		
Before-Master	----	----	----	----	<table><tr><td></td><td></td></tr></table>				
After-Before	----	----	----	----	<table><tr><td></td><td></td></tr></table>				

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:																		
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<table><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>															
Th Peak Location - 0		Master	209.630	201.000	213.899	218.250	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															
		Before	----	----	----	----	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															
		After	----	----	----	----	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															
		Before-Master	----	----	----	----	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															
		After-Before	----	----	----	----	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															
Th Peak Resolution - 0	%	Master	7.000	5.000	6.729	9.000	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															
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Background Count Rate - 0	CPS	Master			0.000		<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															
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Gain Ratio - 0		Master	1.000	0.940	1.025	1.060	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															
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		Before-Master	----	----	----	----	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															
		After-Before	----	----	----	----	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>															

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:						
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<table><tr><td></td><td></td></tr></table>			
Th Peak Location - 0		Master	209.630	201.000	214.368	218.250	<table><tr><td></td><td></td><td></td></tr></table>			
		Before	----	----	----	----	<table><tr><td></td><td></td></tr></table>			
After	----	----	----	----	<table><tr><td></td><td></td></tr></table>					
Before-Master	----	----	----	----	<table><tr><td></td><td></td></tr></table>					

Th Peak Resolution - 0	%	After-Before Master Before After Before-Master After-Before	----- 7.000 ----- ----- ----- -----	----- 5.000 ----- ----- ----- -----	----- 7.705 ----- ----- ----- -----	----- 9.000 ----- ----- ----- -----	
Background Count Rate - 0	CPS	Master Before After Before-Master After-Before	----- ----- ----- ----- -----	----- ----- ----- ----- -----	0.000 ----- ----- ----- -----	----- ----- ----- ----- -----	
Gain Ratio - 0		Master Before After Before-Master After-Before	1.000 ----- ----- ----- -----	0.940 ----- ----- ----- -----	1.028 ----- ----- ----- -----	1.060 ----- ----- ----- -----	

HNGS Background and Na22 Set Point Determination - Detector 1 Calibration

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point - 0		Master Before After Before-Master After-Before	40.000 ----- ----- ----- -----	38.000 ----- ----- ----- -----	40.000 ----- ----- ----- -----	43.500 ----- ----- ----- -----	

HNGS Background and Na22 Set Point Determination - Detector 2 Calibration

Master (EEPROM): 16:37:03 16-Nov-2013		Before:		After:			
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Na 511 Peak Set Point - 0		Master Before After Before-Master After-Before	40.000 ----- ----- ----- -----	38.000 ----- ----- ----- -----	40.000 ----- ----- ----- -----	43.500 ----- ----- ----- -----	

Company:
Anadarko E&P Onshore LLC

Well:
Murphy 1-31 M

Field:
Greenwood

County:
Morton

State:
Kansas

Schlumberger

HOLE AND CEMENT VOLUME
GAMMA RAY
FUTURE CASING SIZE = 5.5"