

# BAKER HUGHES



COMPENSATED Z-DENSITOG<sup>SM</sup>  
 GAMMA RAY LOG  
 CALIPER LOG  
 (BULK DENSITY PRESENTATION)

## Baker Atlas

FILE NO: \_\_\_\_\_ COMPANY: SIERRA GEOTHERMAL POWER, INC.  
 WELL: ALUM 25-29  
 FIELD: ALUM  
 COUNTY: ESMERALDA STATE: NEVADA  
 APN NO: 27-008-90074

Ver. 3.87 LOCATION: SILE: 2235.18' FSL & 938.11' FNL  
 TIGHT HOLE SW/C  
 SEC 29 TWP 1N RGE 28.5 E  
 OTHER SERVICES: HDIL, CH, XMAC, STAR/CBIL

PERMANENT DATUM G.L. \_\_\_\_\_ ELEVATION 4803.57 FT  
 LOG MEASURED FROM K.B. \_\_\_\_\_ 18.0 FT ABOVE P.D.  
 DRILL MEAS. FROM K.B. \_\_\_\_\_  
 ELEVATIONS: KB 4919.57 FT, DF \_\_\_\_\_, OL 4803.57 FT

DATE	25-NOV-2008	
RUN	TRIP	3
SERVICE ORDER	575896	
DEPTH DRILLER	3314 FT	
DEPTH LOGGER	3312 FT	
BOTTOM LOGGED INTERVAL	3308 FT	
TOP LOGGED INTERVAL	2100 FT	
CASING DRILLER	10.75 IN @ 2300 FT	
CASING LOGGER	2280 FT	
BIT SIZE	9.875 IN	
TYPE OF FLUID IN HOLE	LSD	
DENSITY	8.8 LB/G	40 S
PH	9.7	8.03
SOURCE OF SAMPLE	FLGMLINE	
RM AT MEAS. TEMP.	0.885 G/HM	67.72 DEGF
RMF AT MEAS. TEMP.	0.826 G/HM	67.54 DEGF
RMG AT MEAS. TEMP.	1.018 G/HM	68.90 DEGF
SOURCE OF RMF	MEASURED	MEASURED
RM AT BHT	0.288 G/HM	222 DEGF
TIME SINCE CIRCULATION	18.75 HOURS	
MAX. RECORDED TEMP.	222 DEGF	
EQUIP. NO.	IN-4232	FALLON, NV
RECORDED BY	C. PEAVY	
WITNESSED BY	J. HANBLIN	

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT. BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

**REMARKS**

RUN 2 TRIP 3 :  
 CVOL AND BVOL ARE PRESENTED IN CUBIC FEET  
 CVOL WAS COMPUTED USING 8.825" CASING  
 CALIPER WAS VERIFIED IN CASING

MATRIX = SANDSTONE  
 RHO M: 2.85 G/CC AND RHO F: 1.0 G/CC

A MAXIMUM READING THERMOMETER WAS RUN AS WELL AND THE MAXIMUM TEMPERATURE IT REACHED WAS: DEGF

THANK YOU FOR CHOOSING BAKER ATLAS!  
 CREW: R. DANKLEPSEN AND J. HAYCOCK  
 RIG: ENSIGN 561

EQUIPMENT DATA						
RUN	TRIP	TOOL	SERIES NO.	SERIAL NO.	POSITION	
3	3	SRB	8840	10165644	FBT	

2	3	TRM	3981A	10217218	FREE
2	3	WTS	3514A	10200359	FREE
2	3	DSL	1329A	10203000	DE-CENTRALIZED
2	3	GM	2446A	178881	DE-CENTRALIZED
2	3	ZDL	2234A	10334813	RAD-DEVICE

## MAIN LOG 5"/100FT SCALE (BULK DENSITY)

ECLIPS 6.01 Feb 21, 2008  
Updates: 1,43

Wed Nov 25 11:22:40 2009

Perplt /main/62

Cplot

Pdf\_Cpp /main/16

Fileview 5.42

### PARAMETER AND FILTER SUMMARY REPORT

File: /dat1a/575998/k771110.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 1852.500 ff BOTTOM DEPTH: 3320.250 ff

#### SYMMETRIC FILTER

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ff)
Y AXIS CALIPER	FILTER ()	medium (1)		TOP BOTTOM
TENSION	FILTER ()	medium (1)		" "
GR	FILTER ()	medium (1)		" "
CALIPER	FILTER ()	medium (1)		" "
	FILTER (.h)	medium (1)		" "
	FILTER (.l)	medium (1)		" "
ZDL MED RES	FILTER (hrd1*)	medium		" "
	FILTER (hrd1a*)	medium		" "
	FILTER (hrd2*)	medium		" "
	FILTER (hrd2a*)	medium		" "
	FILTER (soft*)	medium		" "
ZDL HIGH RES	FILTER (hrd1*)	light		" "
	FILTER (hrd1a*)	light		" "
	FILTER (hrd2*)	light		" "
	FILTER (hrd2a*)	light		" "

#### BOREHOLE & CEMENT

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ff)
CASING - BOREHOLE & CEMENT VOLUME	CASING O.D.	8.625	1n	TOP BOTTOM
BIT SIZE	BIT SIZE	9.875	1n	" "

#### ZDL PROCESSING

MEASUREMENT TYPE	PARAMETER	VALUE	UNITS	INTERVAL (ff)
ZDL	DENK TRACKING	ON		TOP BOTTOM

### CURVE DESCRIPTION REPORT

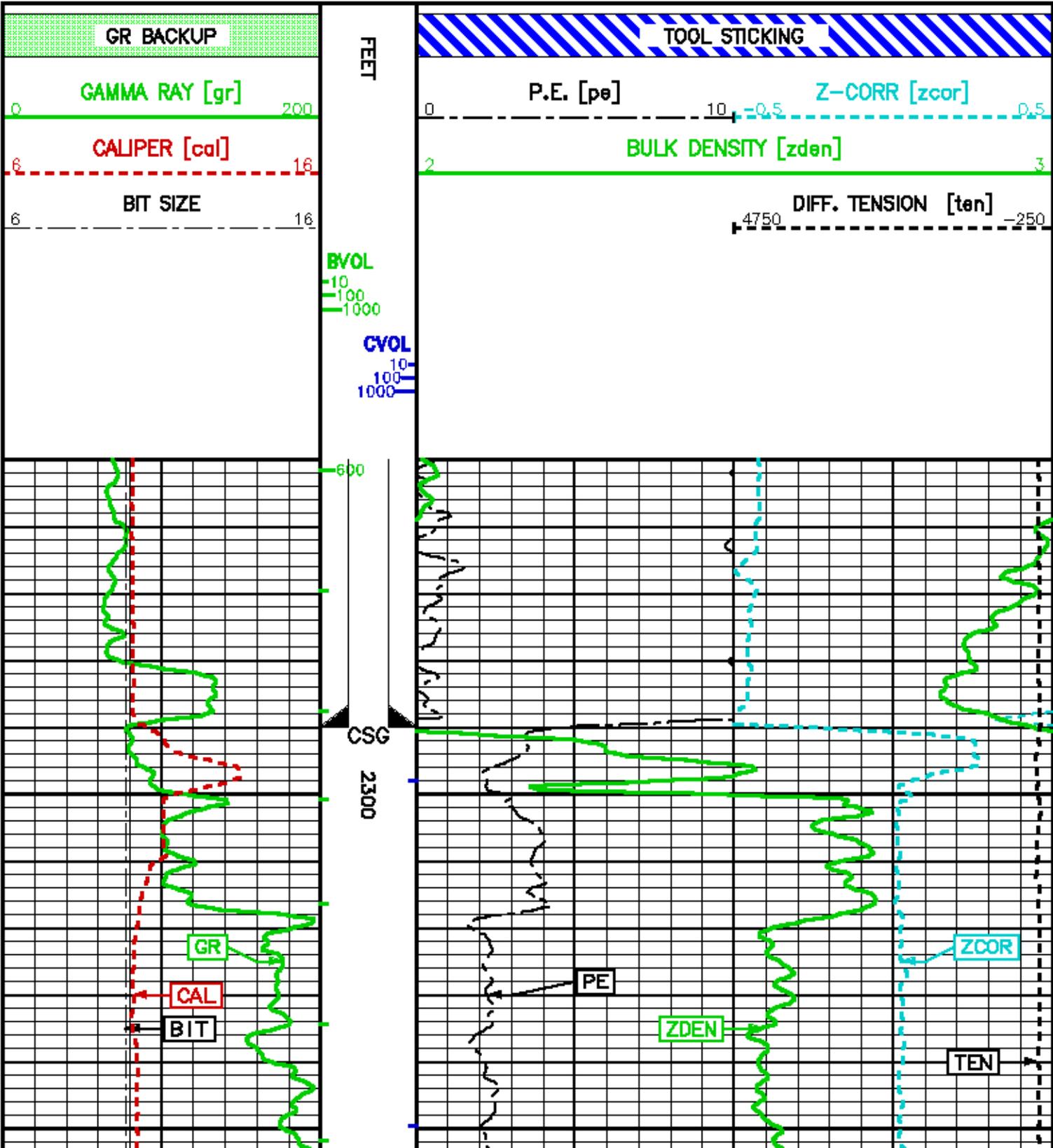
CURVE NAME	CURVE ALIAS	CREATION DATE	CURVE DESCRIPTION
F1:BIT	BIT	Nov 25 09:46:46 2009	BIT SIZE
F1:BYOL	BYOL	Nov 25 09:46:46 2009	BOREHOLE VOLUME
F1:CAL	CAL	Nov 25 09:46:46 2009	CALIPER
F1:CYOL	CYOL	Nov 25 09:46:46 2009	CEMENT VOLUME
F1:GR	GR	Nov 25 09:46:46 2009	GAMMA RAY
F1:PE	PE	Nov 25 09:46:46 2009	PHOTO ELECTRIC CROSS-SECTION
F1:TEN	TEN	Nov 25 09:46:46 2009	DIFFERENTIAL TENSION
F1:ZCOR	ZCOR	Nov 25 09:46:46 2009	DENSITY CORRECTION
F1:ZDEN	ZDEN	Nov 25 09:46:46 2009	FORMATION BULK DENSITY

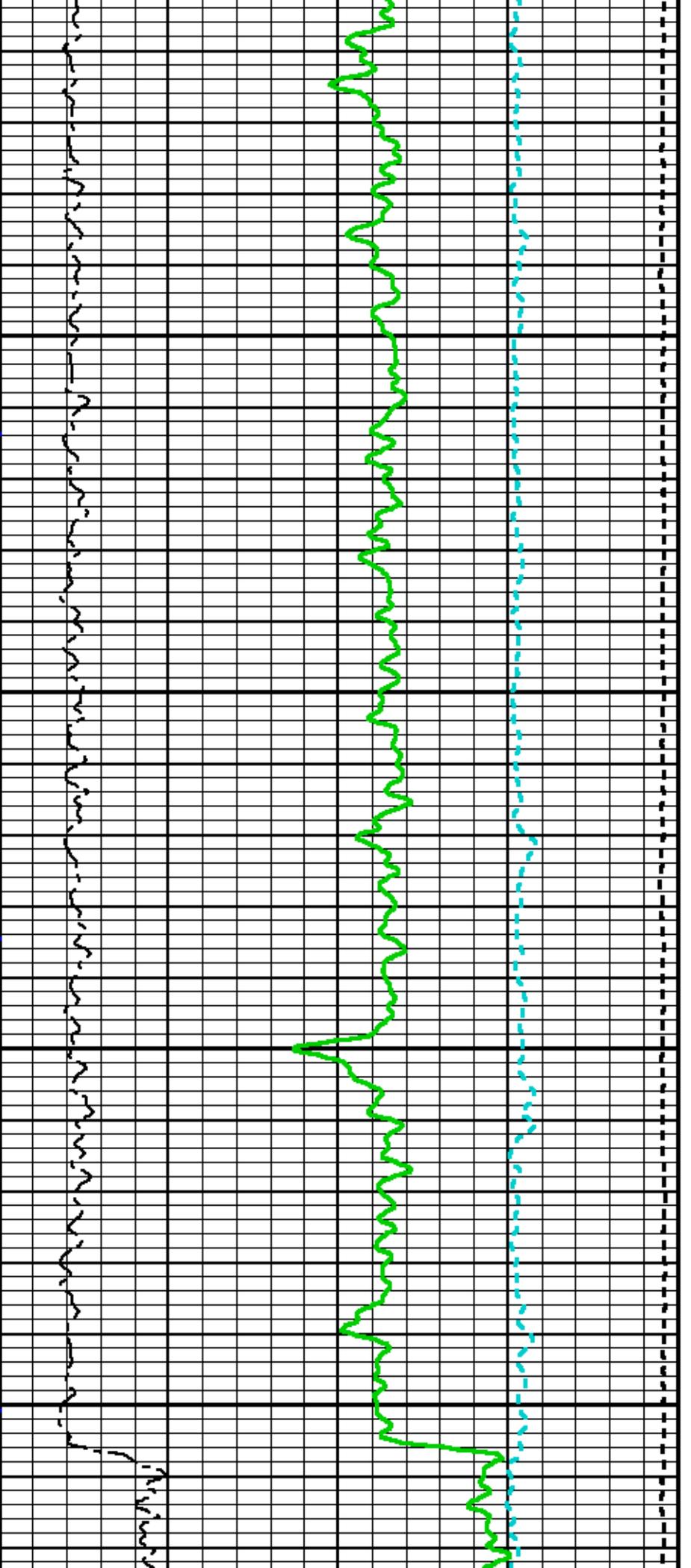
### CURVE MEASURE POINT OFFSET

CURVE MEASURE POINT OFFSET

CURVE	OFFSET (ft)						
BIT	0.00	GR	21.38	TEN	0.00	ZDEN	3.50
CAL	4.00	PE	3.50	ZCOR	3.50		

Presentation : opul:/dat/a/575996/ZDLCN\_BULK\_MAIN.pdf [5"/100' Scale]  
 Plot Interval : 2250 - 3319.5 Feet  
 Data File 1 : F1 : opul:/dat/a/575996/9\_ZDL-CN\_MAIN.rtf  
 Created On : Nov 25 09:46:46 2009  
 Company : SIERRA GEOTHERMAL POWER, INC.  
 Well : ALUM 25-29  
 Field : ALUM  
 File Interval : 1818 - 3319.5 Feet  
 Oct : k7711

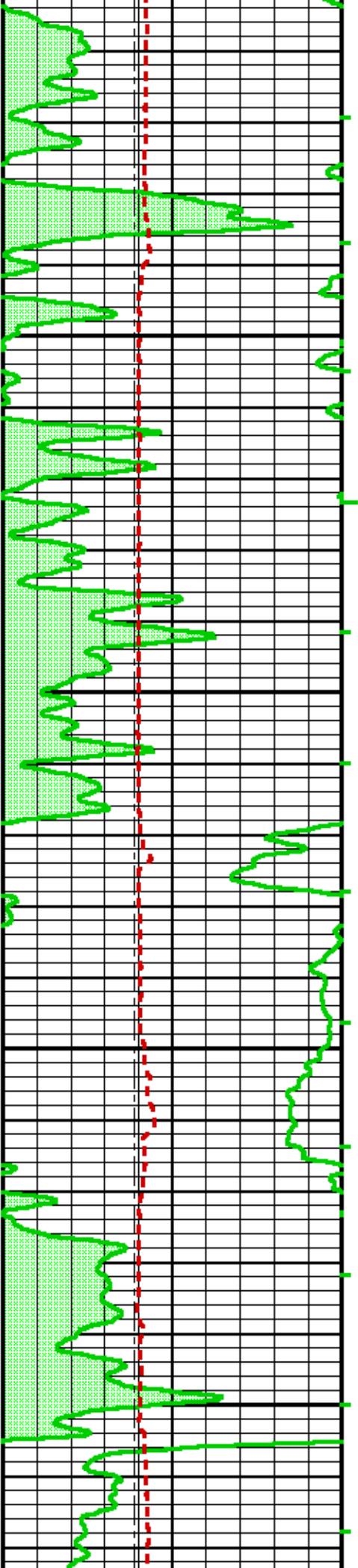


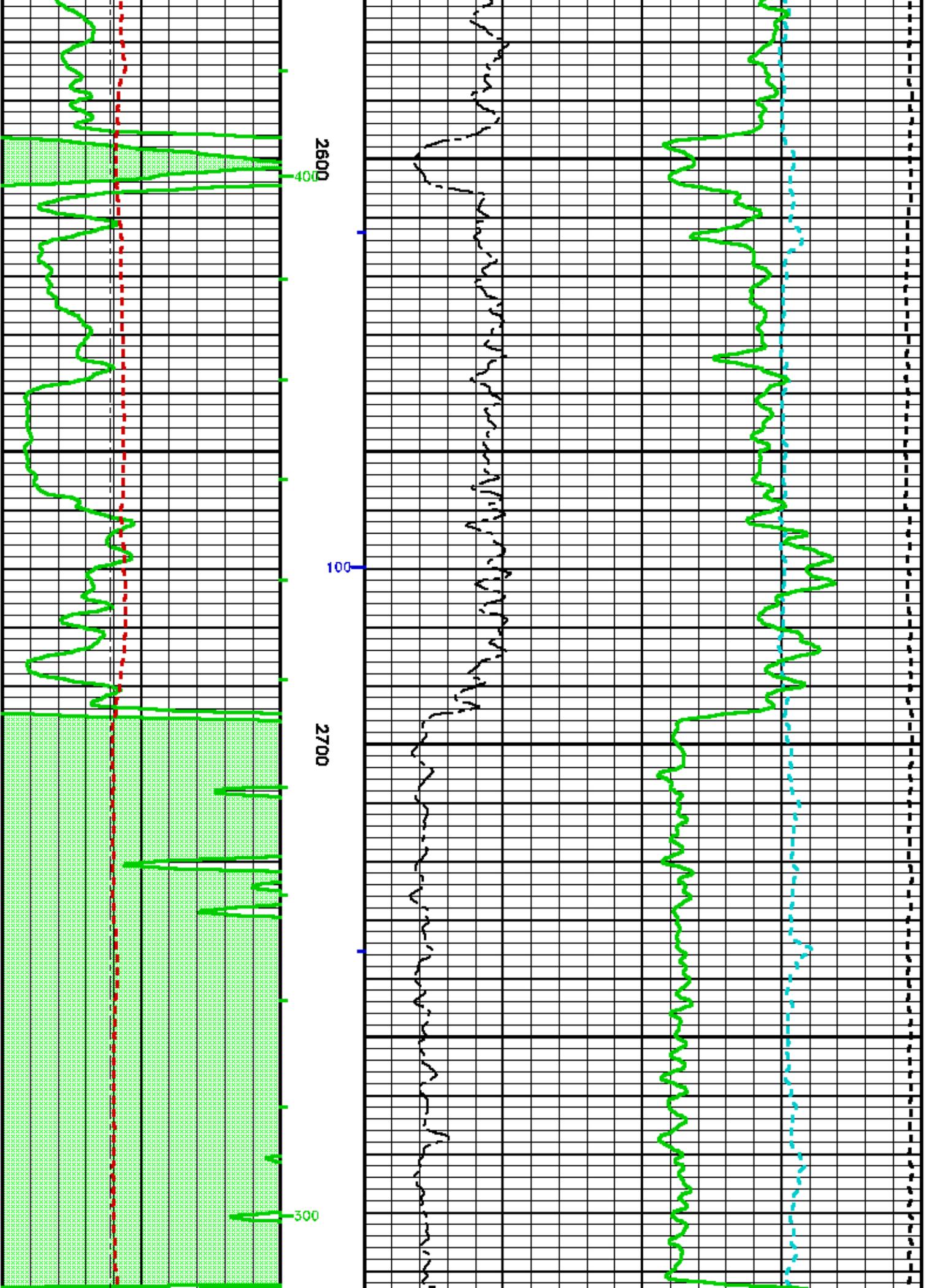


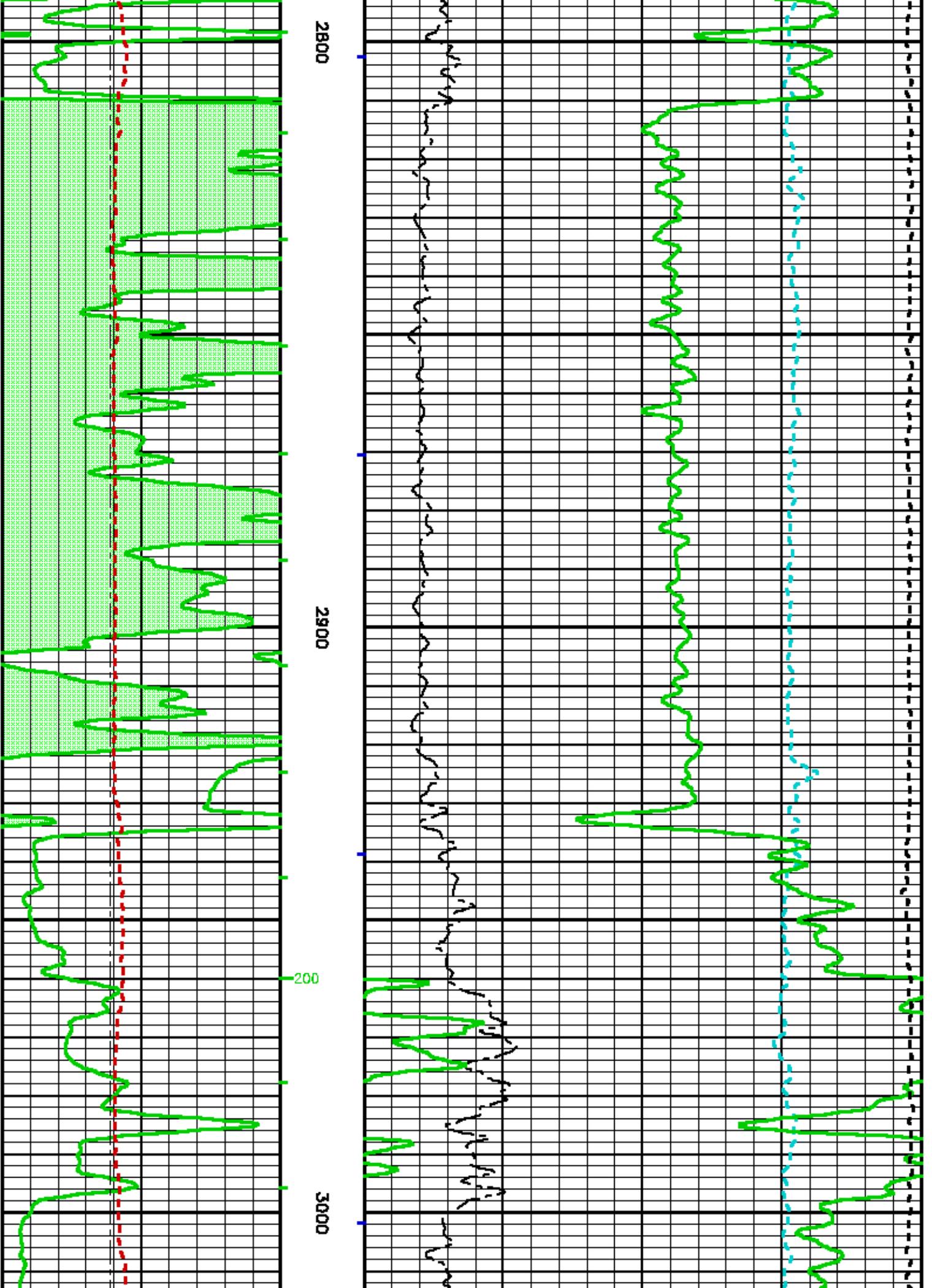
2400

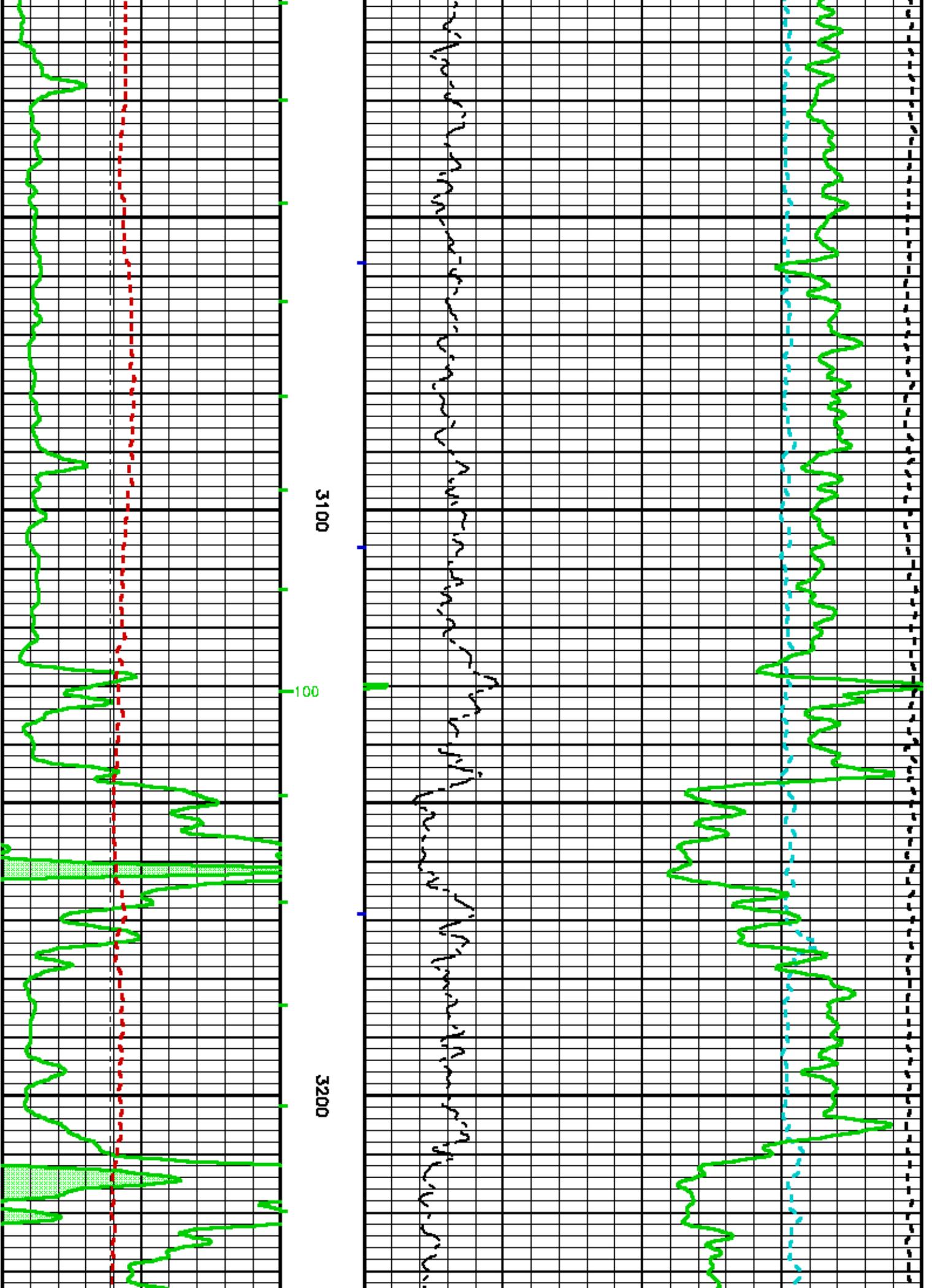
2500

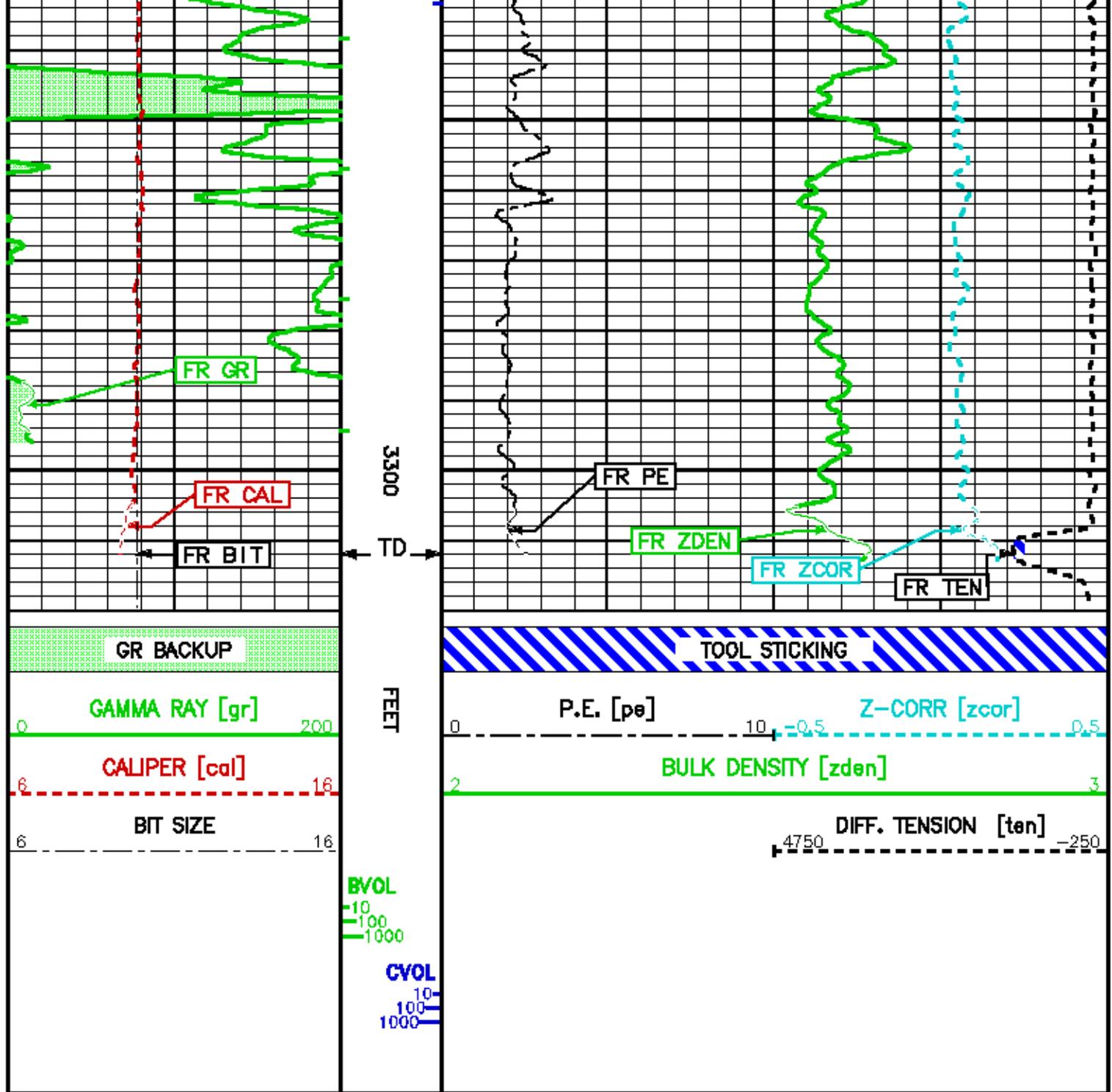
500











## CALIBRATION / VERIFICATION SUMMARY

Source File: /data/578898/k7714a1

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 10203000

DATE/TIME PERFORMED: Sun Oct 25 14:28:31 2009

UNIT #: 3885TD ML4232

CALB JIG #: 4702NK DA-321

	BACKGROUND CALBRTR ON (cts/s)	GR DIFF (cts/s)	MULT	BACKGROUND CALBRTR ON (gAPI)	CALBRTR (gAPI)
GR	269.02	1162.96	0.168	45.14	150
		893.9		195.14	
		930.0		960.0	

### GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 10203000

DATE/TIME PERFORMED: Sun Oct 25 14:33:28 2009

UNIT #: 3885TD ML4232 VERI JIG #: 4702NK DA-321

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	269.44	1191.73	0.168	45.21	199.97	154.76
						140.00 160.00

### GR BEFORE LOG VERIFICATION SUMMARY

TOOL #: 1329XA 10203000

DATE/TIME PERFORMED: Tue Nov 24 23:50:39 2009

DAYS SINCE CAL: 30

UNIT #: 3885TD ML4232 VERI JIG #: 4702NK DA-321

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	255.24	1118.22	0.168	42.83	187.64	144.81
						144.78 184.78

### GR AFTER LOG VERIFICATION SUMMARY

TOOL #: 1329XA 10203000

DATE/TIME PERFORMED: Wed Nov 25 02:08:11 2009

DAYS SINCE CAL: 30

UNIT #: 3885TD ML4232 VERI JIG #: 4702NK DA-321

	BACKGROUND (cts/s)	CALBRTR ON (cts/s)	MULT	BACKGROUND (gAPI)	CALBRTR ON (gAPI)	DIFF. (gAPI)
GR	303.09	1132.69	0.168	50.86	190.06	139.21
						134.81 154.81

### CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 2234XA 10334913

DATE/TIME PERFORMED: Sun Oct 25 11:23:52 2009

UNIT #: 3885TD ML4232

	SMALL RING (in)	LARGE RING (in)	MULT	ADD	SMALL RING (in)	LARGE RING (in)
CALIPER	1746.0	2563.6	0.00749	-5.20505	7.875	14.000

### CAL BEFORE LOG VERIFICATION SUMMARY

TOOL #: 2234XA 10334913

DATE/TIME PERFORMED: Wed Nov 25 09:15:37 2009

DAYS SINCE CAL: 30

UNIT #: 3885TD ML4232

	I.D. (in)	MULT	ADD	I.D. (in)
CALIPER	2089.2	0.00749	-5.60111	10.050

### CAL AFTER LOG VERIFICATION SUMMARY

TOOL #: 2234XA 10334913

DATE/TIME PERFORMED: Wed Nov 25 10:23:05 2009

DAYS SINCE CAL: 30

UNIT #: 3885TD ML4232

	I.D. (in)	MULT	ADD	I.D. (in)
CALIPER	2090.8	0.00749	-5.60111	10.062
				9.590 10.050

## ZDL PRIMARY CALIBRATION SUMMARY

 TOOL: 2234XA 10334913

 DATE/TIME PERFORMED: Sun Oct 25 11:51:34 2009

 UNIT: 3885TD ML4232

 CALB BLKS: 2225XA 094299

 CS SRC: 4705XA 27781B

	SS CS PK (Channel)	LS CS PK (Channel)	SS_BKGD (cps)	LS BKGD (cps)		
	225.3	225.1	1363.3	1697.9		
	280.0	230.0	280.0	230.0		
	SS (cps)	LS (cps)	SHR	DEN (g/cm3)	CORR (g/cm3)	PE (b/e)
MG (LO PE)	27679.6	14416.8	0.615	1.699	0.003	2.150
AL	16156.7	1444.9	0.265	2.695	-0.009	
AL + SHIM	22362.0	2545.6		2.613	0.157	
MG + SHIM (HI PE)	13486.0	6894.9	0.248			8.700
			0.215			
RATIO AL + SHIM/AL	1.38	1.76				
	1.32	1.42	1.84	1.84		
RATIO MG/AL	1.71	9.98				
	1.66	1.78	9.40	10.20		

## ZDL BEFORE LOG VERIFICATION SUMMARY

 TOOL #: 2234XA 10334913

 DATE/TIME PERFORMED: Wed Nov 25 06:16:23 2009

 DAYS SINCE CAL: 30

 UNIT #: 3885TD ML4232

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	1695.0	226.3	1270.7
	1697.9	1797.9	1100.0
	230.0	230.0	1550.0
SS	1351.6	228.2	1303.7
	1283.3	1463.3	230.0
	230.0	230.0	1100.0
	1550.0		
	LV (V)	PAD CURRENT (mA)	
	5.0	72.9	
	4.8	5.2	60.0
			120.0

## ZDL AFTER LOG VERIFICATION SUMMARY

 TOOL #: 2234XA 10334913

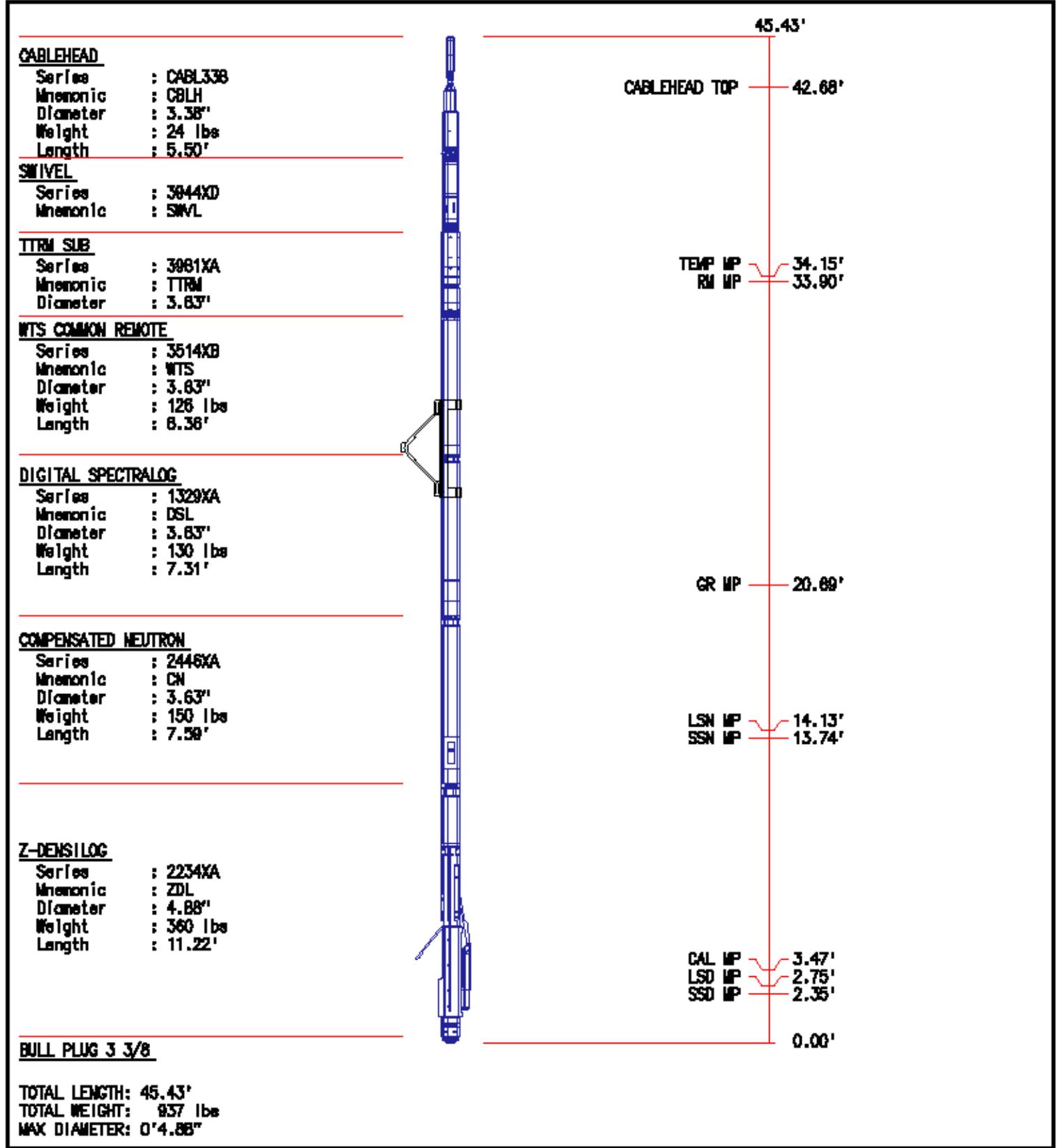
 DATE/TIME PERFORMED: Wed Nov 25 10:54:03 2009

 DAYS SINCE CAL: 31

 UNIT #: 3885TD ML4232

	TOTAL (cps)	CSPK (Channel)	HV (V)
LS	1686.5	224.0	1269.2
	1697.9	1797.9	1100.0
	230.0	230.0	1550.0
SS	1349.5	223.1	1294.1
	1283.3	1463.3	230.0
	230.0	230.0	1100.0
	1550.0		
	LV (V)	PAD CURRENT (mA)	
	5.0	66.0	
	4.8	8.2	60.0
			120.0

# INSTRUMENT CONFIGURATION



 Baker Atlas 	COMPANY <u>SIERRA GEOTHERMAL POWER, INC.</u> WELL <u>ALUM 25-29</u> FIELD <u>ALUM</u> COUNTY <u>ESMERALDA</u> STATE <u>NEVADA</u>	FILE NO: _____ API NO: <u>27-009-80074</u>
	LOCATION: SHL: 2235.18' FSL & 938.11' FWL SW/C	ELEVATIONS: KB 4919.57 FT DF GL 4903.57 FT



SEC 29 TWP 1N RGE 38.5 E

DATE 25-NOV-2009