



ThruBit

A Schlumberger Company

SPECTRAL DENSITY DUAL SPACED NEUTRON GAMMA RAY MEMORY LOG

Company	SANDRIDGE ENERGY, INC.		
Well	DIANA SWD 3305 1-36		
Field	GERBERDING		
County	HARPER	State	KANSAS
Location:	AP1 #: 15-077-21988-00-00		Other Services SONIC LOG
SURF LOC: 200' FSL & 830' FEL			
SEC 36 TWP 33S RGE 5W			
Permanent Datum	G.L.	Elevation	1253'
Log Measured From	D.F.	15' ABOVE PERM DATUM	
Drilling Measured From	D.F.		
Date	18 JANUARY 2014		
Run Number	ONE		
Depth Driller	5095'		
Depth Logger	5053'		
Bottom Logged Interval	5012'		
Top Log Interval	3420'		
Casing Driller	9.625" @ 510'		
Casing Logger	NOT MEASURED		
Bit Size	8.75"		
Type Fluid in Hole	WBM		
Density / Viscosity	9.2 / 52		
pH / Fluid Loss	11.5 / 4.8		
Source of Sample	SUCTION PIT		
Rm @ Meas. Temp	0.30 OHMS@62 DEGF		
Rmf @ Meas. Temp	0.22 OHMS@62 DEGF		
Rmc @ Meas. Temp	0.38 OHMS@62 DEGF		
Source of Rmf / Rmc	CALCULATED		
Rm @ BHT	0.16 OHMS@123 DEGF		
Time Circulation Stopped	02:30 18JAN2014		
Time Logger on Bottom	03:45 18JAN2014		
Maximum Recorded Temperature	123 DEGF		
Equipment Number	T004		
Location	OKC, OK		
Recorded By	D. THOMAS		
Witnessed By	M. KULCHISHY		

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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

SERVICE: LEVEL 3 - VERTICAL MEMORY LOG - BIT DEPTH: 4975' LOG TO: 3420'
ALL SCALES AND PRESENTATIONS PER CLIENT REQUEST
LIMESTONE MATRIX, 2.71 G/CC, USED TO MEASURE POROSITIES
TOOL STRING RAN WITH CENTRALIZERS, S. DECENTRALIZER, SWIVEL, NO STANDOFFS
SONIC TOOL, PS19S, RAN IN COMBINATION WITH TCOM
TBHV = TOTAL BOREHOLE VOLUME, FT3
ABHV = ANNUALR BOREHOLE VOLUME, FT3, CALCULATED FOR 7.0" CSG
PASON AND HSPM USED TO CREATE LOG DEPTH
LOG DEPTH CORRELATED TO PREVIOUS THRUBIT DOWNLOG

RIG: UNIT 310
CREW: D. THOMAS/K. REED/J. HIRST

Service Ticket No. 2503 API No. 15-077-21988-00-00 PGM Ver Warrior 8

The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client

EQUIPMENT DATA

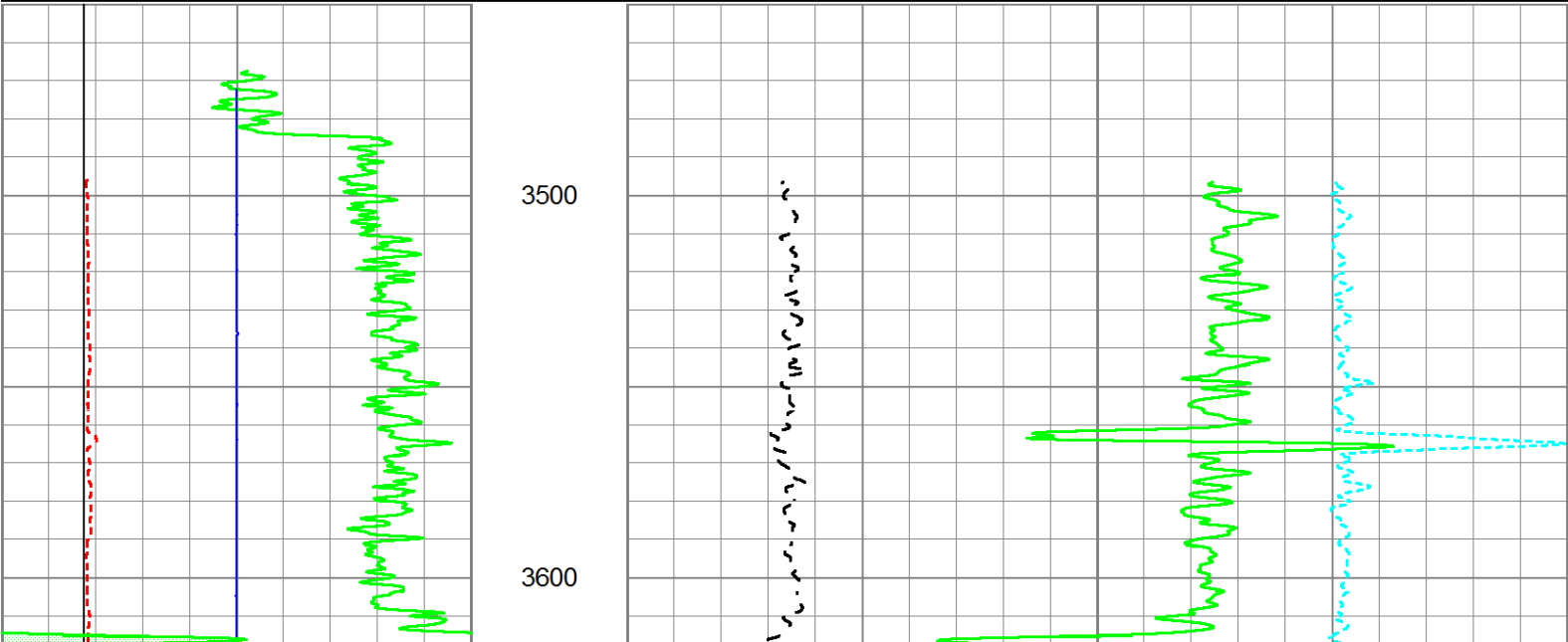
GAMMA RAY		NEUTRON		DENSITY		INDUCTION		
Run No.	ONE	Run No.	ONE	Run No.	ONE	Run No.	ONE	
Serial No.	PS10T	Serial No.	PS5N	Serial No.	PS41D	Serial No.	PS38R	
Model No.	PS	Model No.	PS	Model No.	PS	Model No.	PS	
Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	Diameter	2.125"	
LOGGING DATA								
General Data								
Pass	Depths		Well Head	Speed	Logging Run Comments			
No.	From	To	Pressure	Ft/Min				
ONE	5053'	3420'		30				
	GAMMA RAY		NEUTRON		DENSITY		INDUCTION	
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	R
ONE	0 API	150 API	30 %	-10 %	30 %	-10 %	0.2 OHM-M	2000 OHM-M
DIRECTIONAL INFORMATION								
Maximum Deviation		NA	deg. @	NA	KOP	NA		

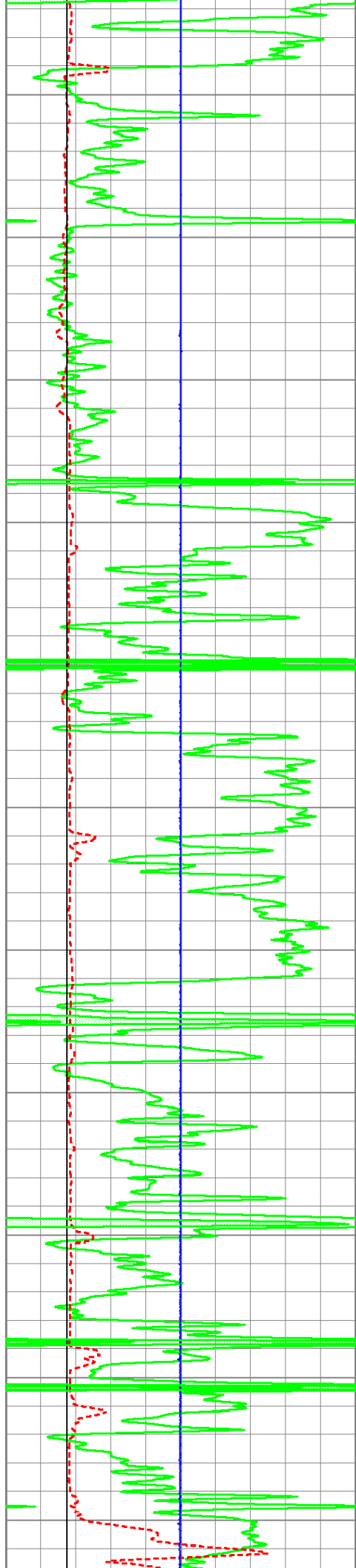


MAIN PASS

Database File	diana_mem.db
Dataset Pathname	proc1/pass1.3
Presentation Format	8_2n_chk
Dataset Creation	Sat Jan 18 08:11:14 2014
Charted by	Depth in Feet scaled 1:600

0	GR (GAPI)	150	0	PEF (barn)	10	-0.5	DRHO (g/cc)	0.5		
7	DCAL (in)	17	2	RHOB (g/cc)				3		
7	BOREID (in)	17								
-5	ACCY	5								





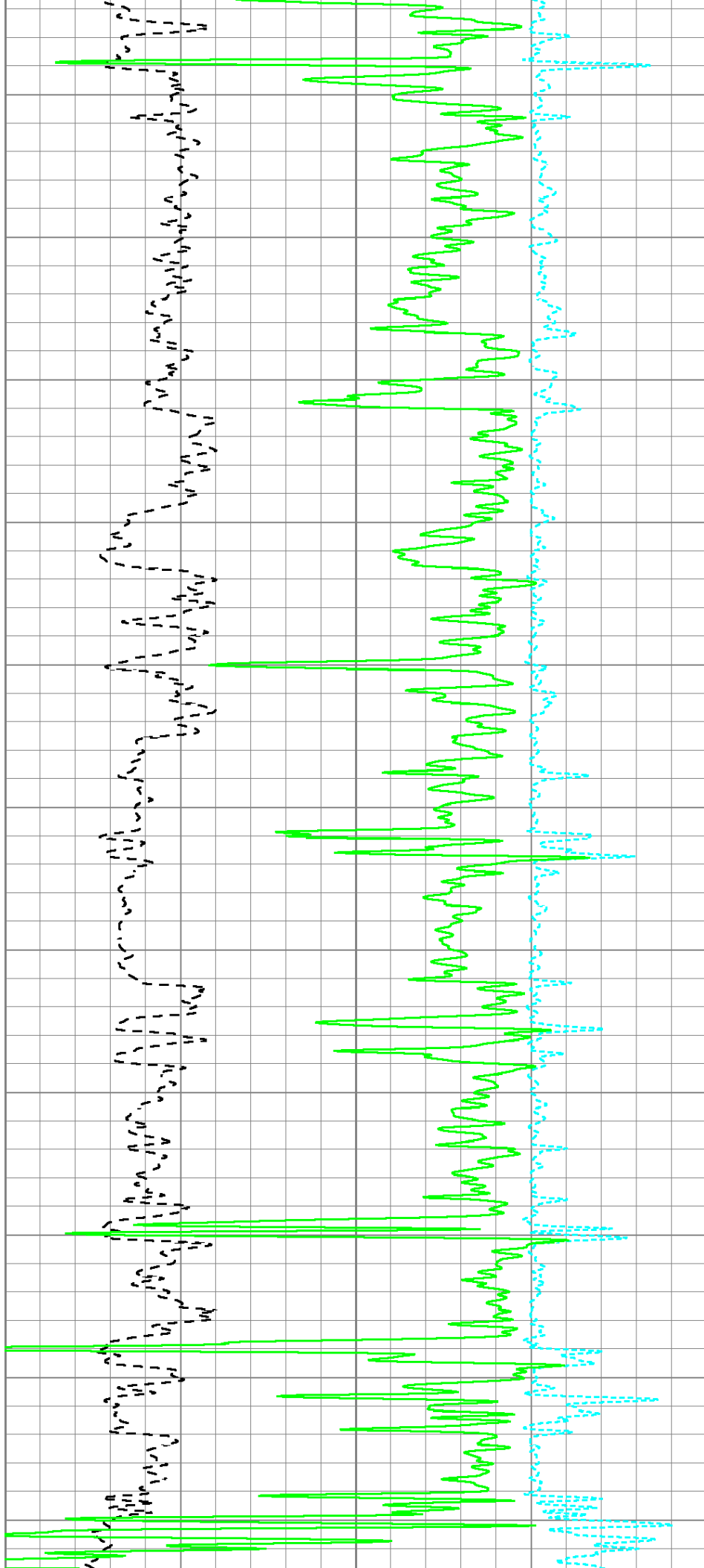
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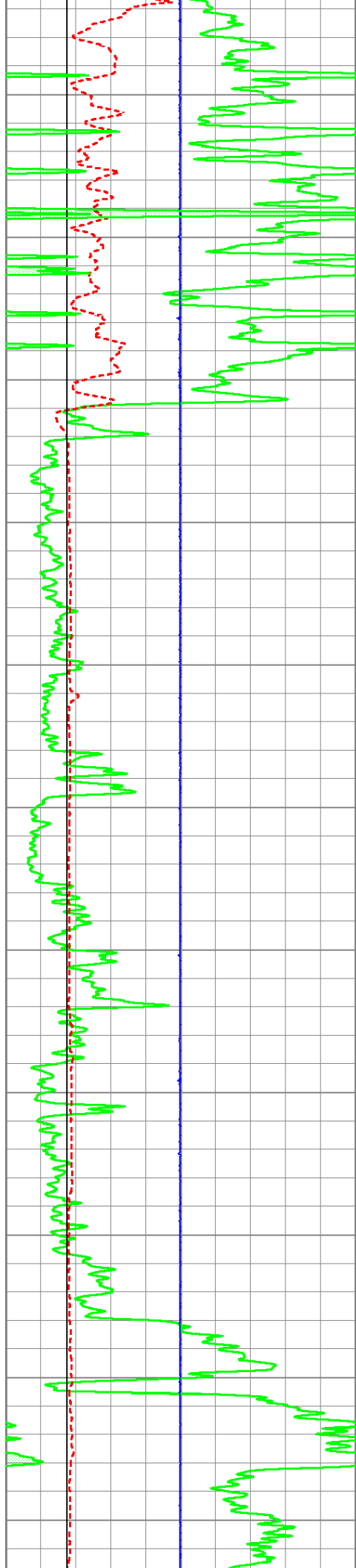
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3900

4000

4100





4200

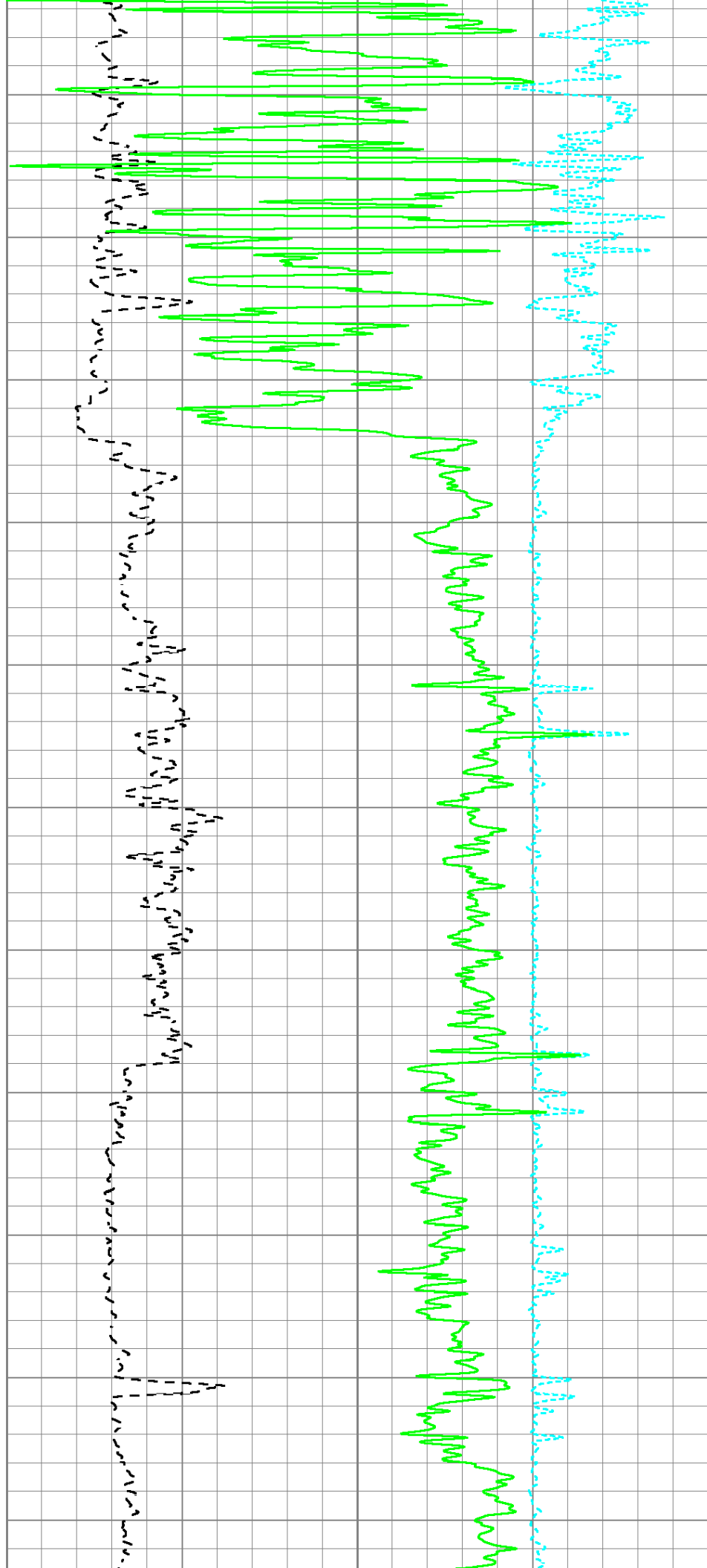
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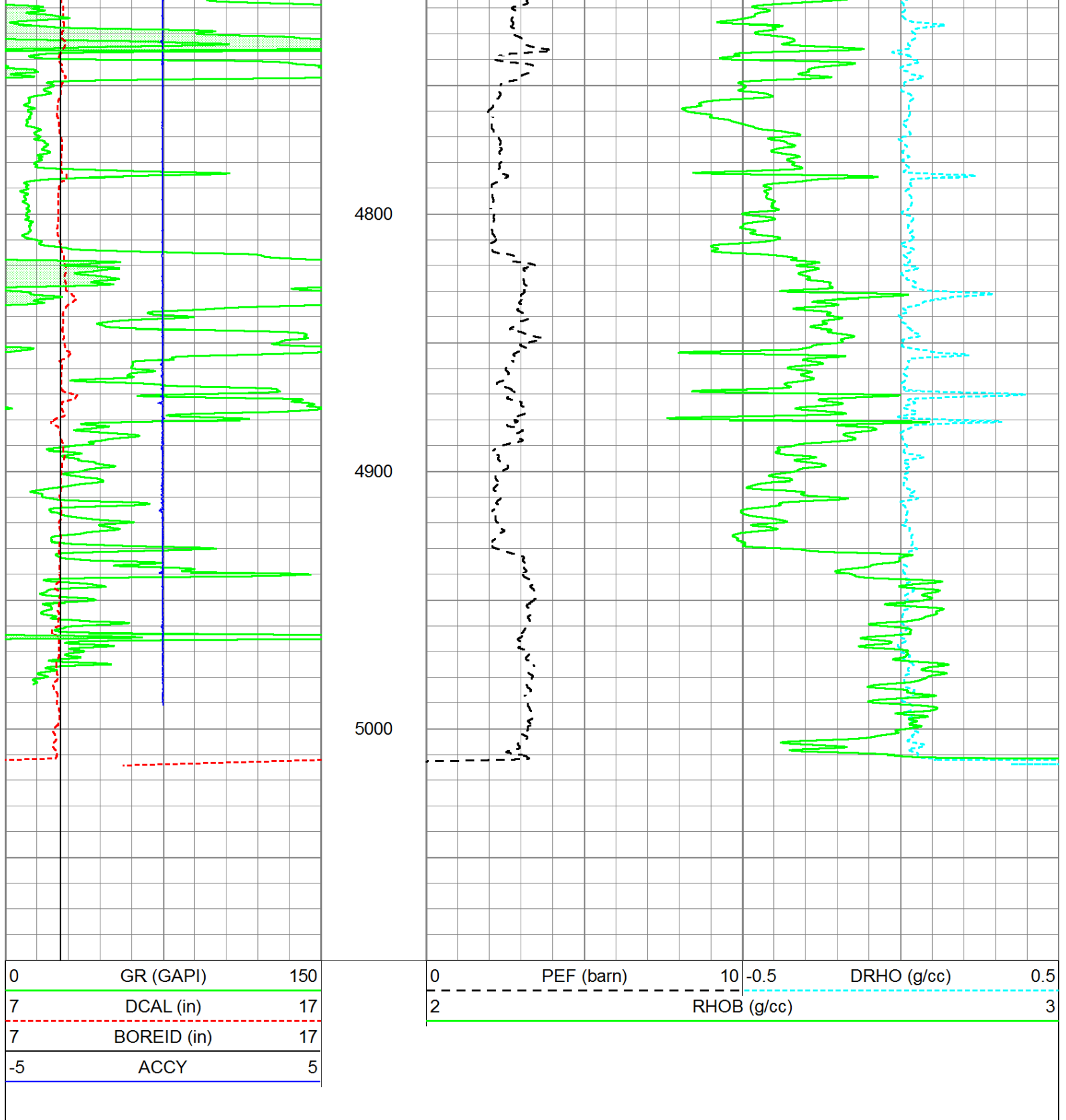
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4500

4600

4700

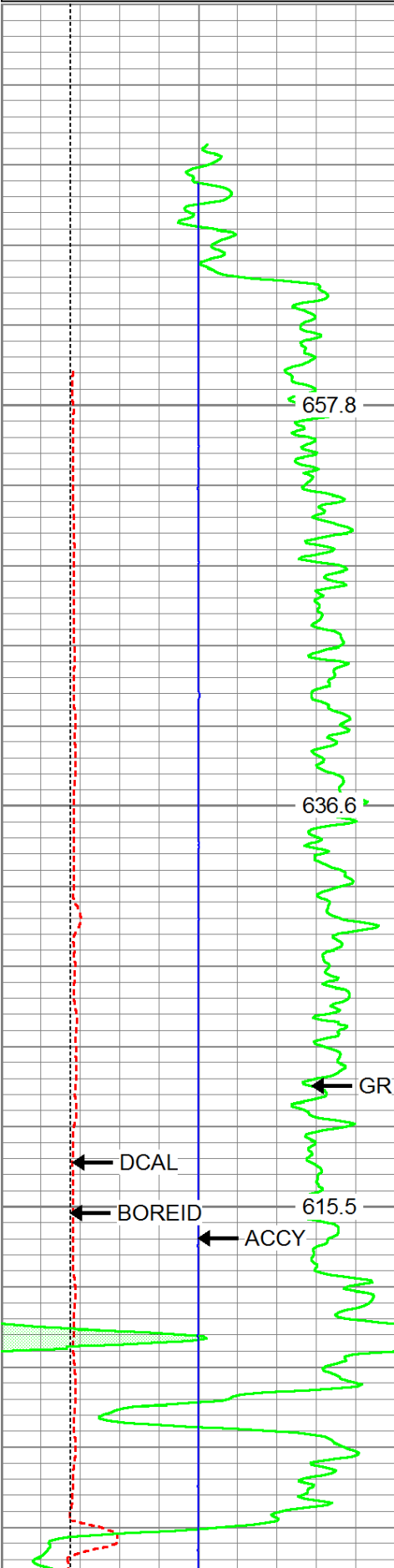




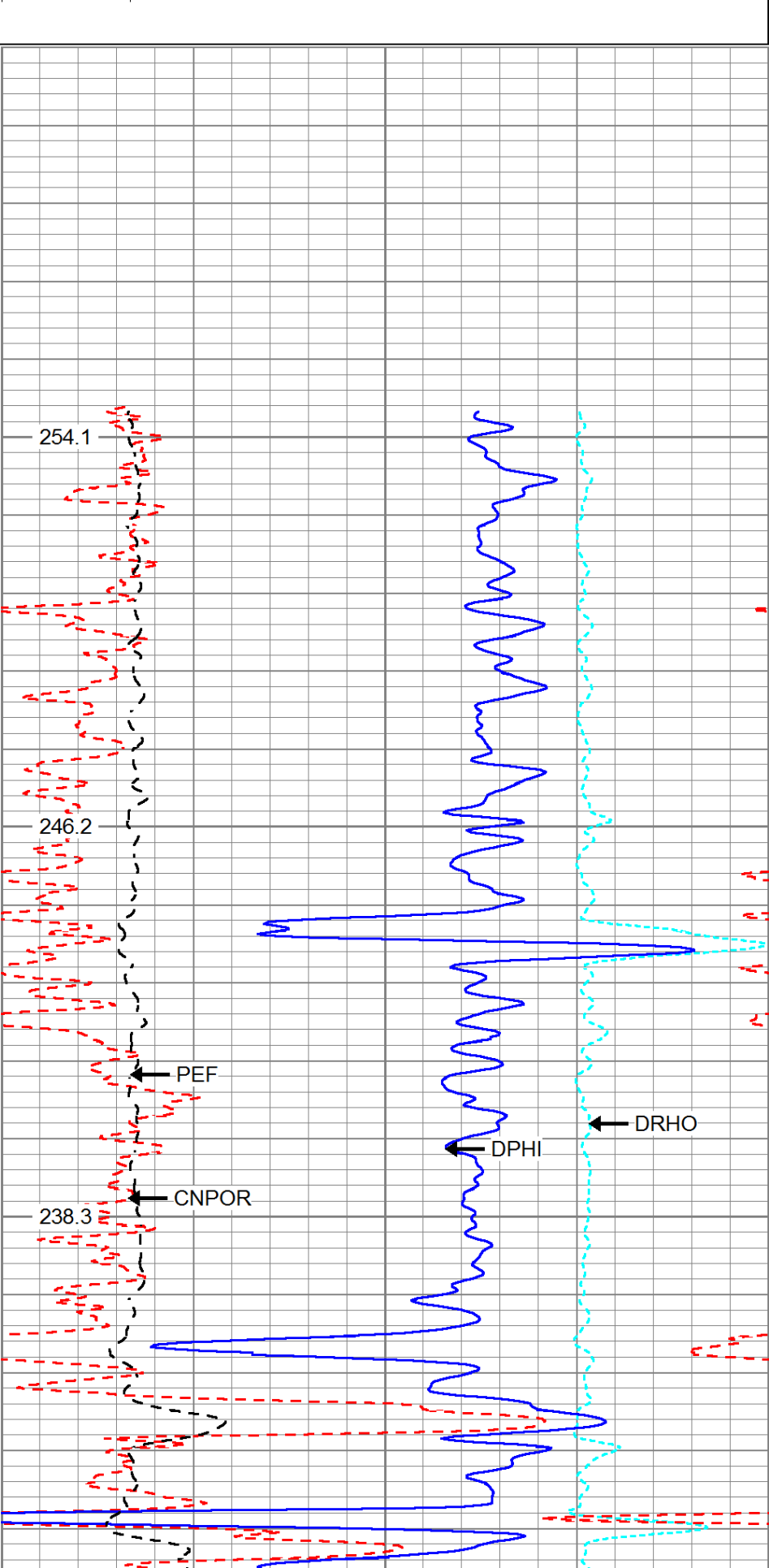
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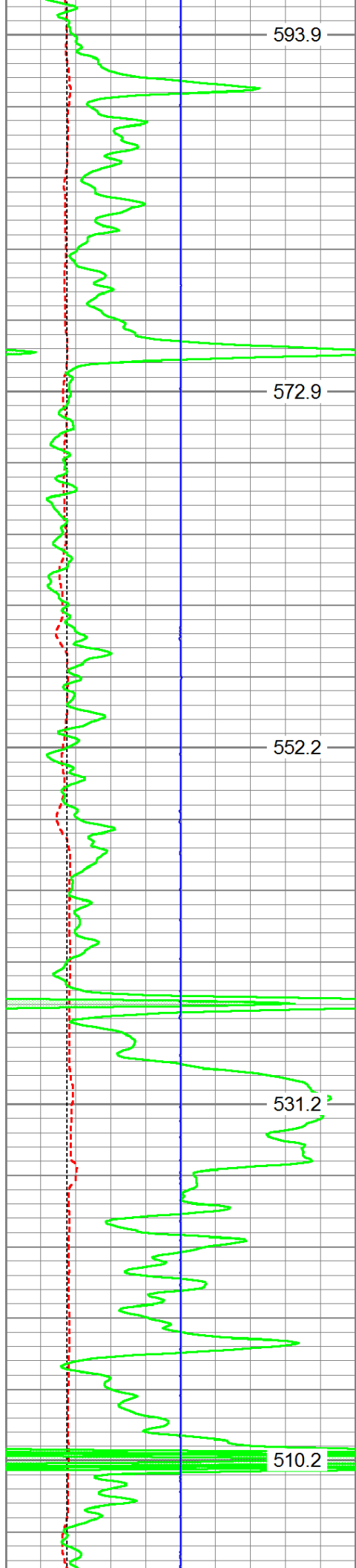
Database File: diana_mem.db
Dataset Pathname: proc1/pass1.3
Presentation Format: 8_5n_chk
Dataset Creation: Sat Jan 18 08:11:14 2014
Charted by: Depth in Feet scaled 1:240

7	DCAL (in)	17
7	BOREID (in)	17
0	GR (GAPI)	150
-5	ACCY	5
	TBHV (ft3)	

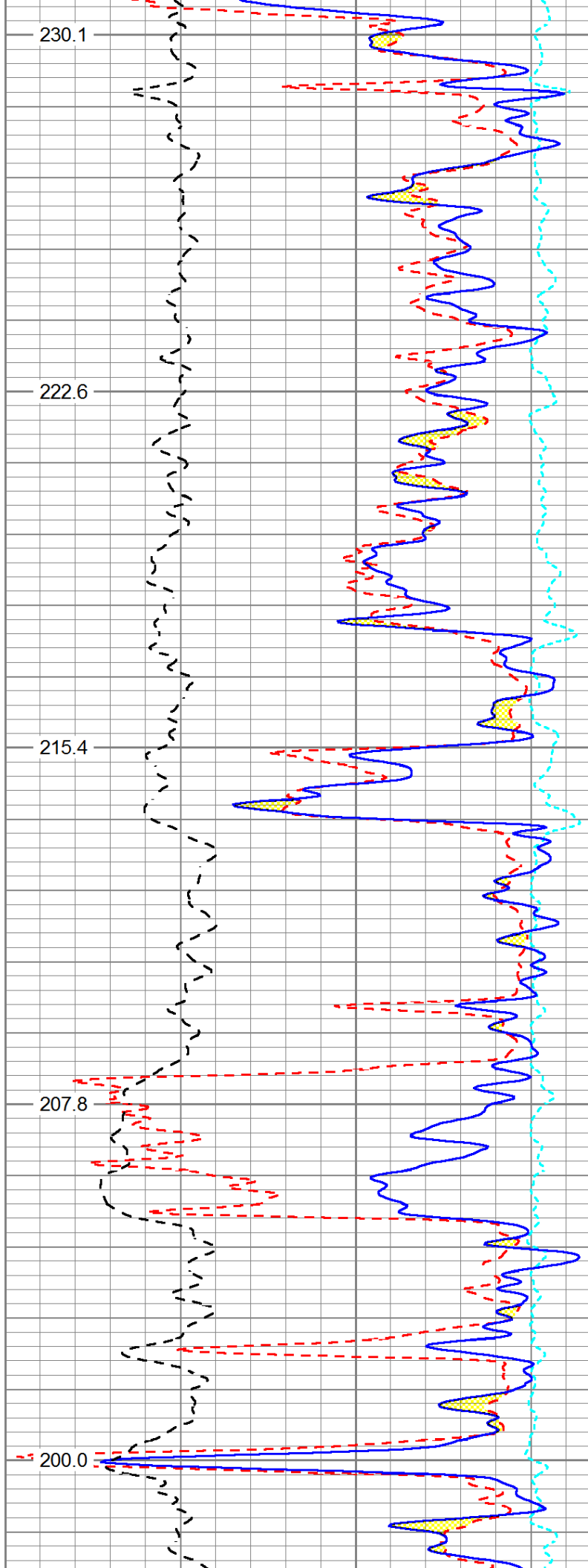


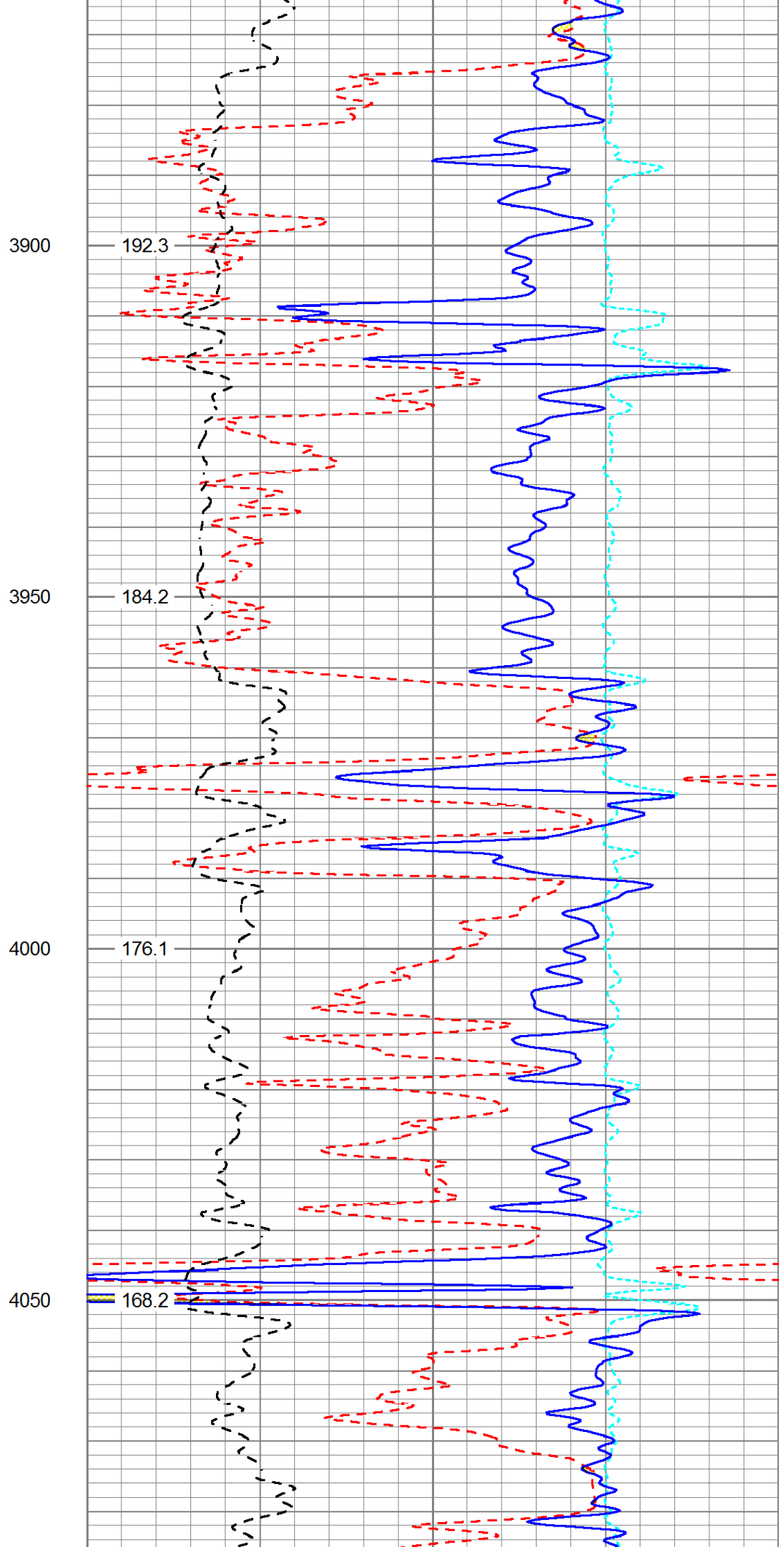
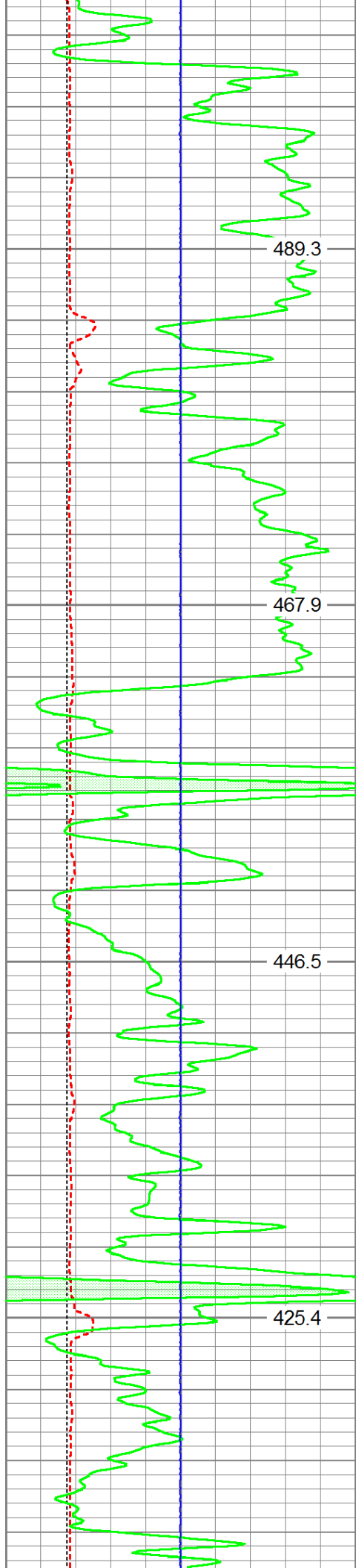
30	CNPOR (pu)	-10
30	DPHI (pu)	-10
0	PEF (barn)	10
	DRHO (g/cc)	0.5
	ABHV (ft3)	

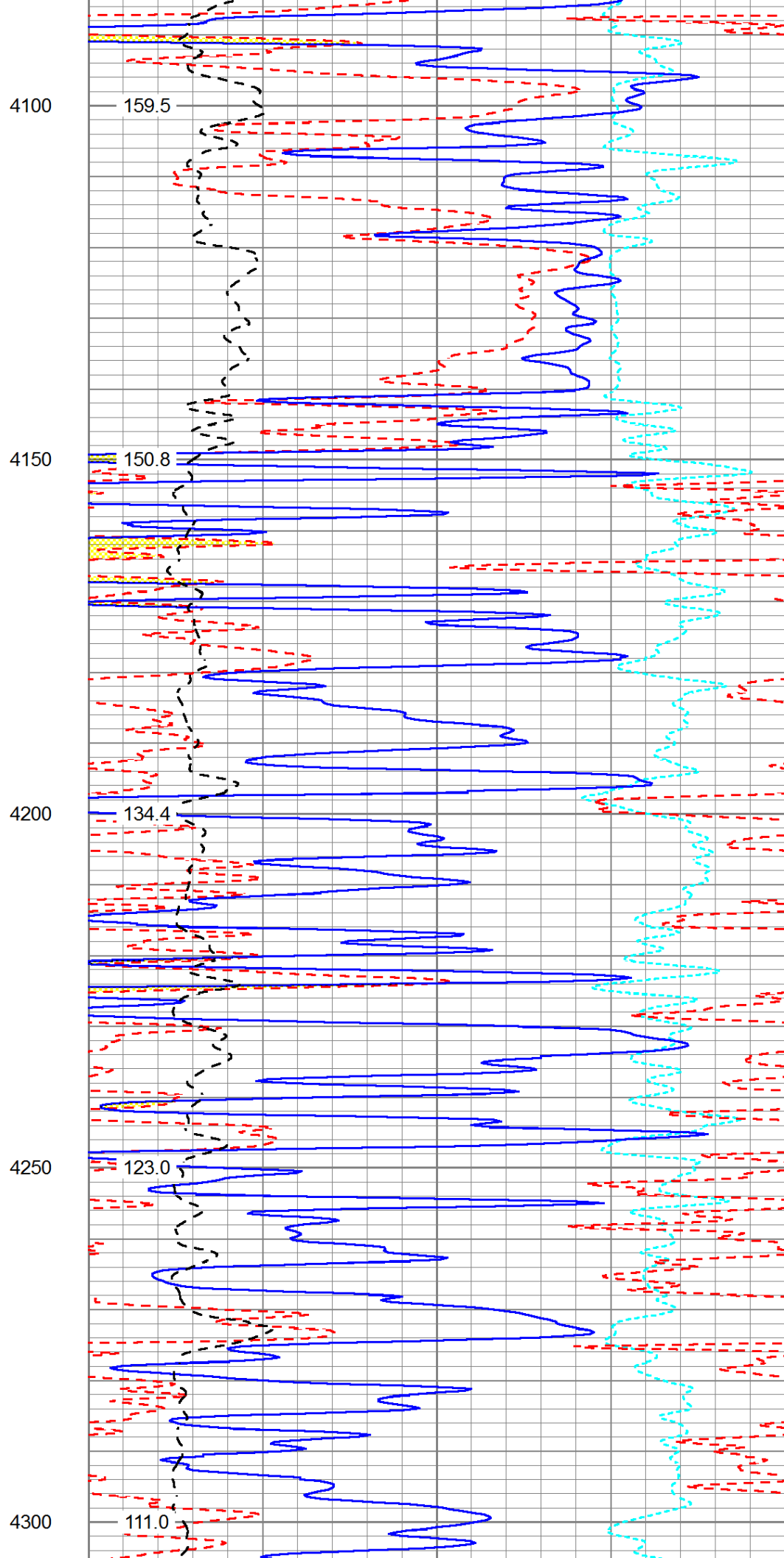
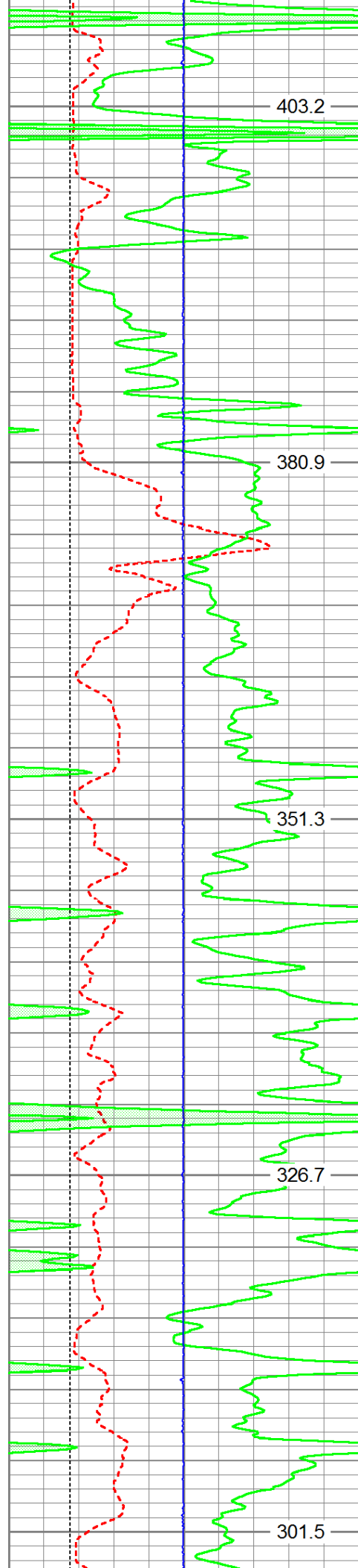


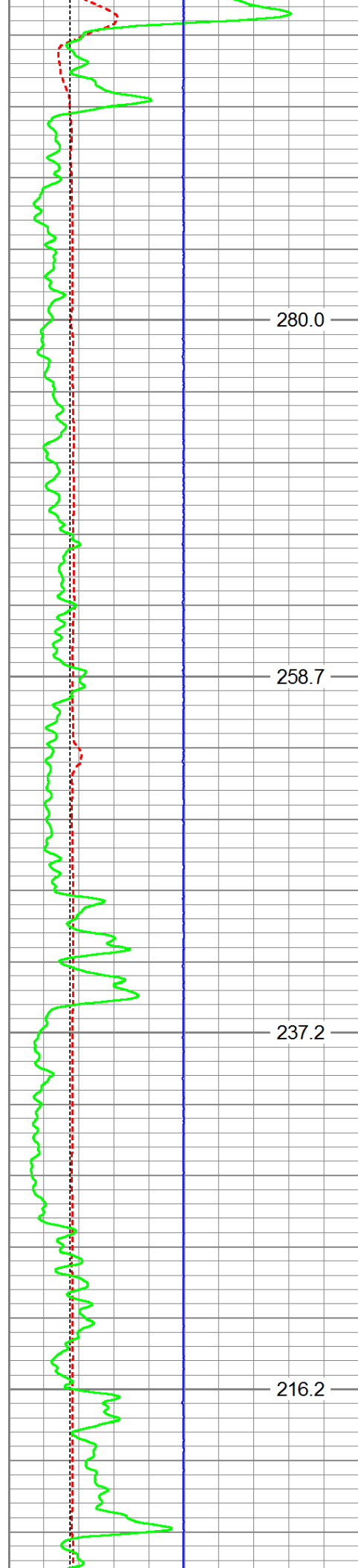


3650
3700
3750
3800
3850









4350

4400

4450

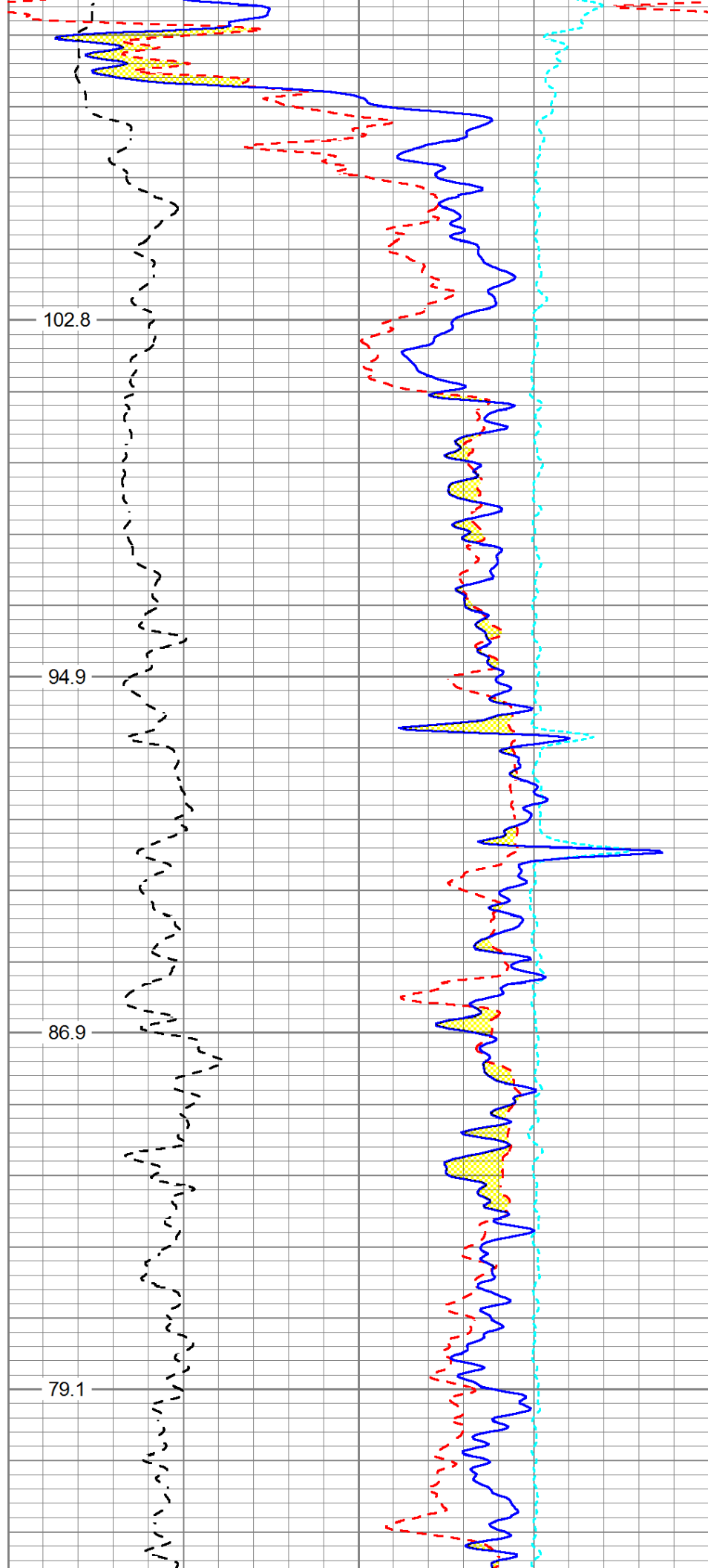
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280.0

258.7

237.2

216.2

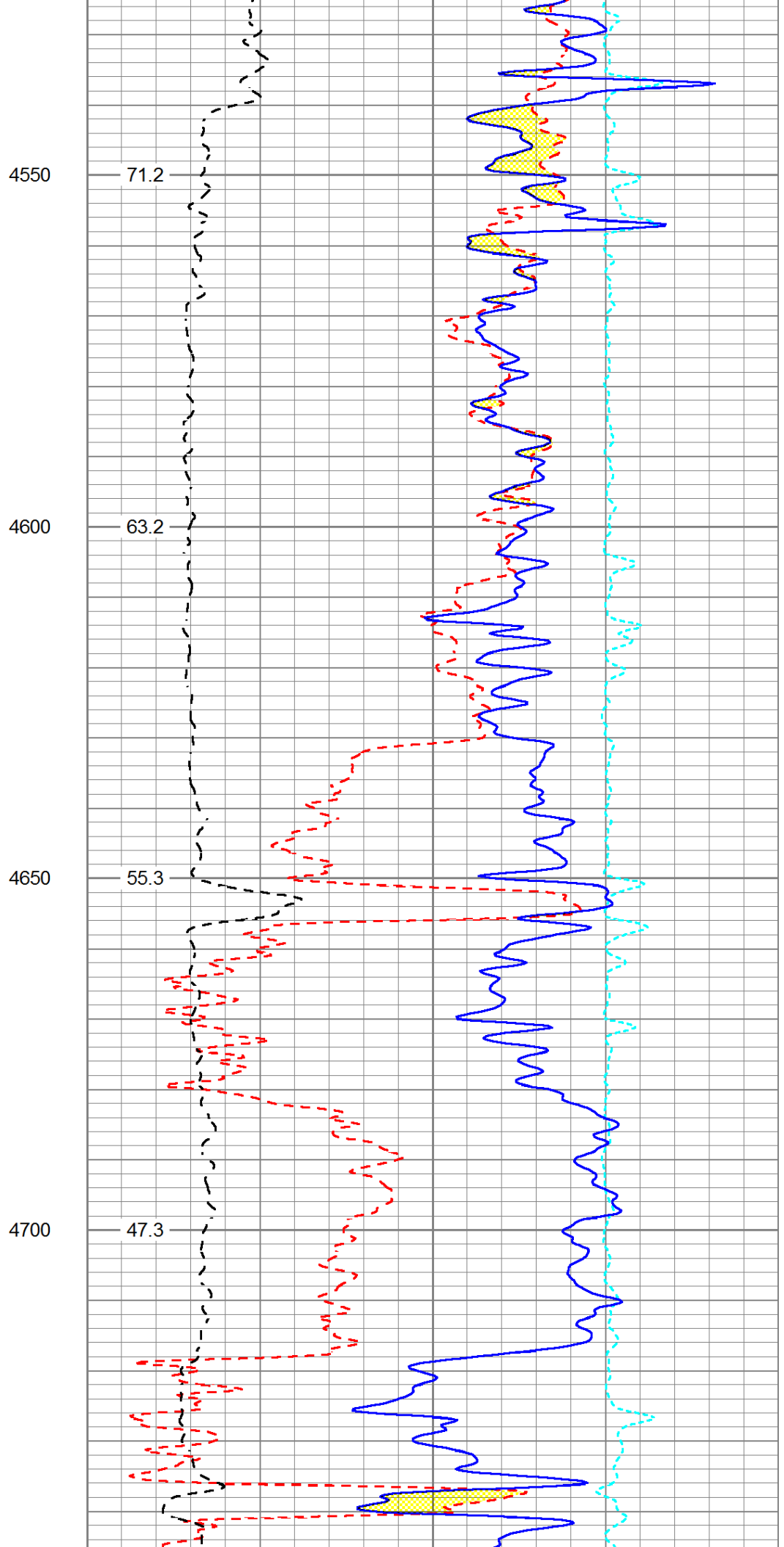
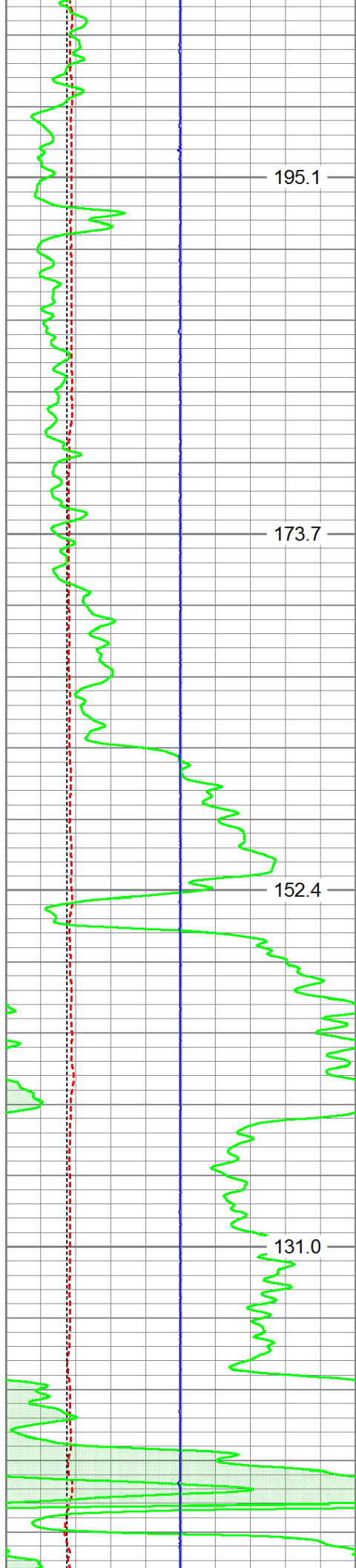


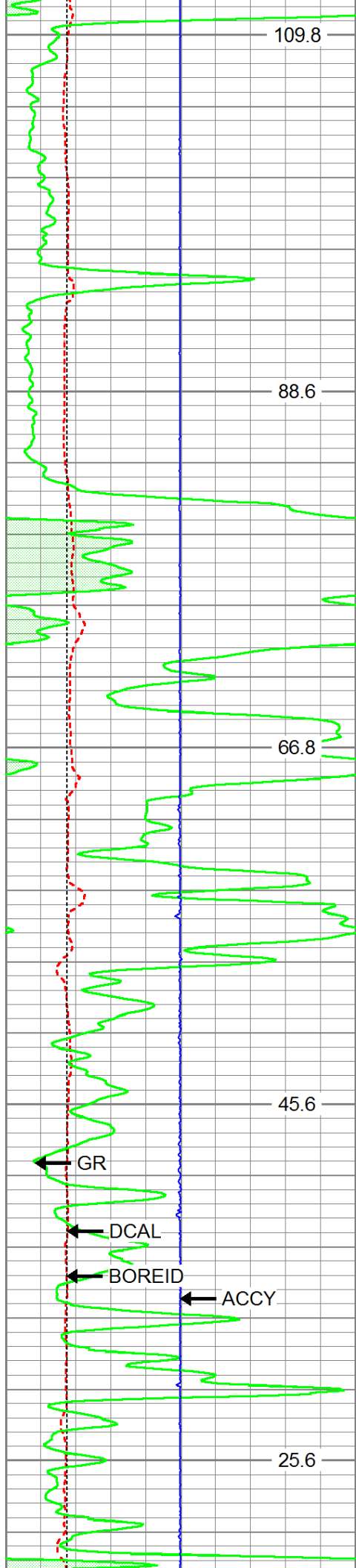
102.8

94.9

86.9

79.1





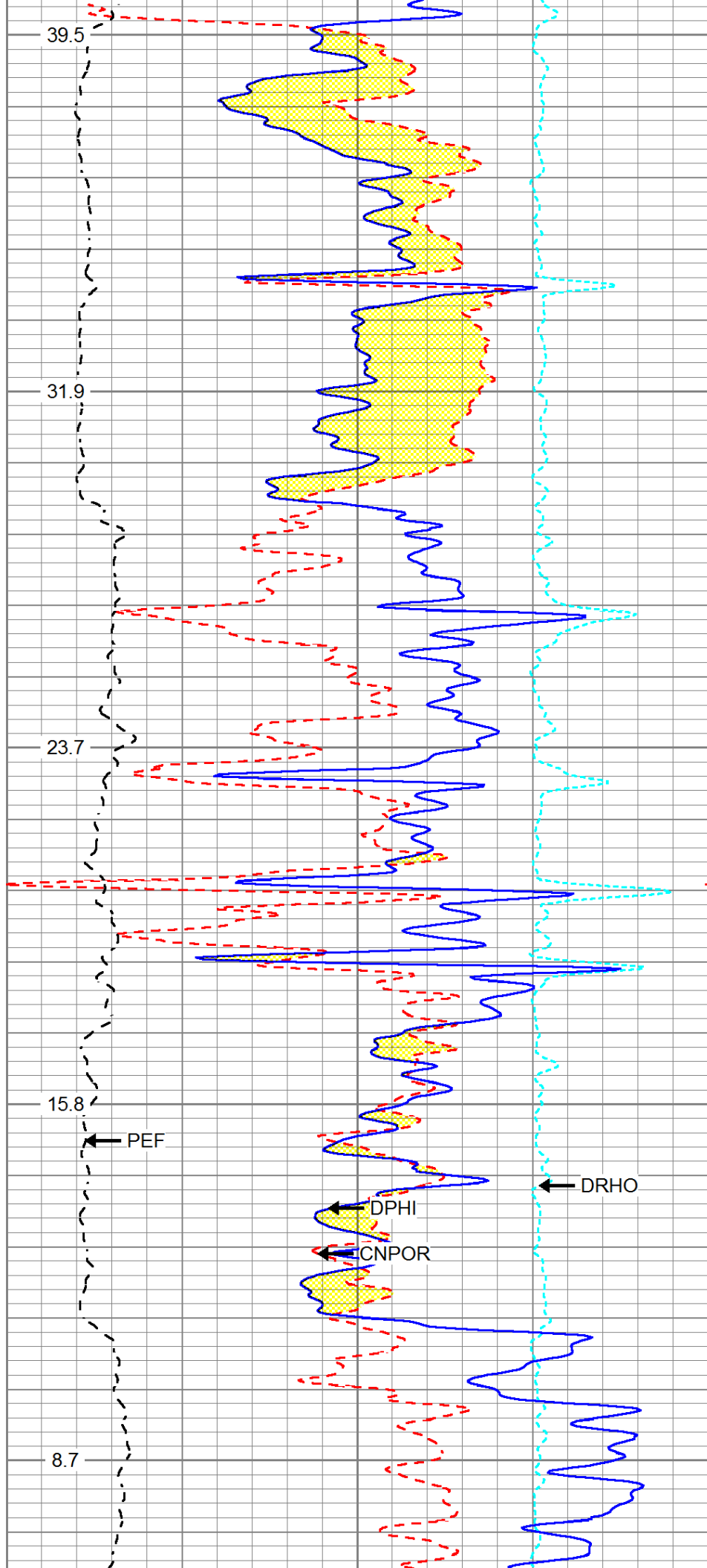
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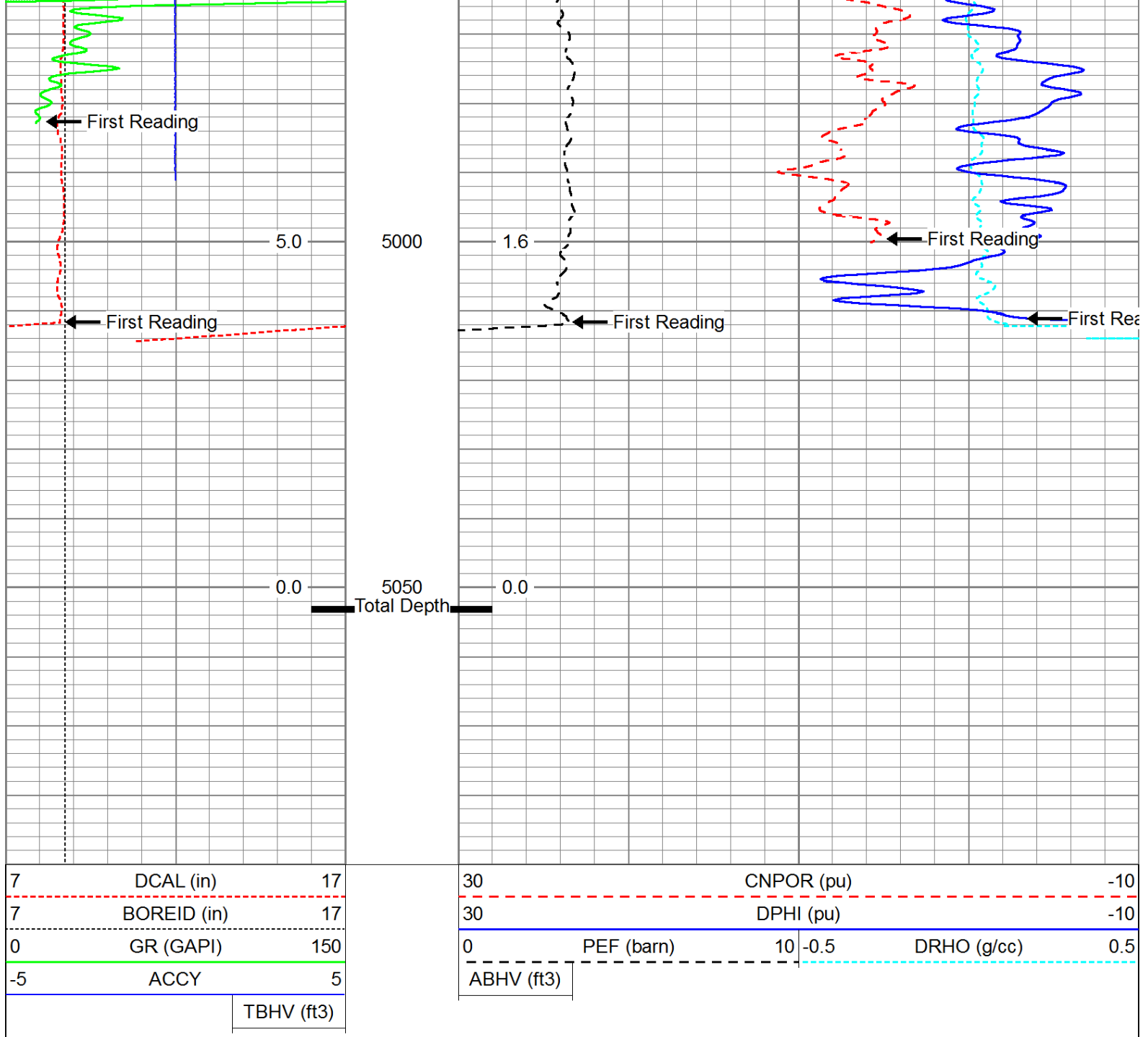
4800

4850

4900

4950





Log Variables

DatabaseC:\ProgramData\Warrior\Data\diana_mem.db
Dataset field/well/proc1/pass1.3

Top - Bottom

A	BHCOR	BHFL_TYPE	BHFLRES Ohm-m	BHFLRESSRC	BHIDSRC	BOREID in	BOTTEMP degF
1	On	WBM	1	MUDCELL	CURVE	8.75	123
CASED?	CASEOD in	CASETHICK	CEMWATERSALIN kppm	INCMTTHCK	DNBHC?	DPORSEL	FLUIDDEN g/cc
No	7	0	0	0	NO	RHOB	1
FRMSALIN kppm	LATNOR	M	MATRXDEN g/cc	MUDSALIN kppm	MudWgt lb/gal	NPORSEL	PEBHC?
0	Off	2	2.71	25	9.2	Limestone	YES
PERFS	RESTMPSRC	SO in	SRFTEMP degF	SZCOR	TDEPTH ft	TMPCOR	TOOLPOS

0	1	0.5	65	On	5095	On	Ec-centered
XXXX							
0							

Calibration Report				
Database File	diana_mem.db			
Dataset Pathname	proc1/pass1.3			
Dataset Creation	Sat Jan 18 08:11:14 2014			
ThruBit Induction Calibration Report				
Tool Model-Serial Number:		PS-PS38R		
Shop Calibration Performed:		Wed Nov 20 15:41:53 2013		
BASELINE				
	R	Expected	X	Expected
Freq 1				
A1	-472.3810	[-536.000, -387.000]	86.6787	[-500.000, 1100.000]
A2	-141.7800	[-162.000, -120.000]	9.0611	[-75.000, 700.000]
A3	-29.3611	[-38.000, -18.000]	-136.2050	[-375.000, 475.000]
A4	-16.8612	[-24.000, -8.000]	235.2940	[25.000, 575.000]
A5	-14.6911	[-21.000, -7.000]	147.1060	[25.000, 275.000]
Freq 2				
A1	-249.2410	[-293.000, -186.000]	26.2440	[-375.000, 675.000]
A2	-90.8768	[-106.000, -76.000]	-24.8920	[-100.000, 425.000]
A3	-20.8931	[-28.000, -13.000]	-141.5550	[-325.000, 250.000]
A4	-20.0141	[-28.000, -10.000]	64.5928	[-75.000, 275.000]
A5	-19.5184	[-27.000, -10.000]	-1.7777	[-125.000, 75.000]
Freq 3				
A1	-160.4060	[-193.000, -108.000]	-51.7879	[-375.000, 425.000]
A2	-68.7679	[-81.000, -57.000]	-62.1568	[-125.000, 250.000]
A3	-17.3280	[-23.000, -11.000]	-163.1780	[-300.000, 125.000]
A4	-21.6642	[-31.000, -11.000]	-50.3343	[-200.000, 100.000]
A5	-22.1622	[-32.000, -11.000]	-110.0060	[-250.000, -25.000]
Freq 4				
A1	-89.7509	[-108.000, -54.000]	-191.7340	[-450.000, 75.000]
A2	-49.2204	[-60.000, -41.000]	-129.0840	[-200.000, 50.000]
A3	-14.0715	[-19.000, -8.000]	-216.6030	[-350.000, -25.000]
A4	-24.7461	[-37.000, -11.000]	-223.0840	[-400.000, -75.000]
A5	-27.8306	[-43.000, -12.000]	-290.7630	[-475.000, -125.000]

CALIBRATION COEFFICIENTS				
	R	Expected	X	Expected
Freq 1				
A1	0.9980	[0.950, 1.050]	-0.0058	[-0.050, 0.050]
A2	0.9916	[0.950, 1.050]	-0.0006	[-0.050, 0.050]
A3	1.0003	[0.950, 1.050]	-0.0062	[-0.050, 0.050]
A4	0.9883	[0.950, 1.050]	0.0036	[-0.050, 0.050]
A5	0.9928	[0.950, 1.050]	0.0009	[-0.050, 0.050]
Freq 2				
A1	0.9917	[0.950, 1.050]	-0.0118	[-0.050, 0.050]
A2	0.9852	[0.950, 1.050]	-0.0060	[-0.050, 0.050]

A2	0.9832	[0.950, 1.050]	-0.0069	[-0.050, 0.050]
A3	0.9882	[0.950, 1.050]	-0.0057	[-0.050, 0.050]
A4	0.9828	[0.950, 1.050]	-0.0035	[-0.050, 0.050]
A5	0.9887	[0.950, 1.050]	-0.0070	[-0.050, 0.050]
Freq 3				
A1	1.0010	[0.950, 1.050]	-0.0124	[-0.050, 0.050]
A2	0.9945	[0.950, 1.050]	-0.0082	[-0.050, 0.050]
A3	0.9970	[0.950, 1.050]	-0.0075	[-0.050, 0.050]
A4	0.9904	[0.950, 1.050]	-0.0051	[-0.050, 0.050]
A5	0.9984	[0.950, 1.050]	-0.0086	[-0.050, 0.050]
Freq 4				
A1	0.9961	[0.950, 1.050]	-0.0078	[-0.050, 0.050]
A2	0.9889	[0.950, 1.050]	-0.0053	[-0.050, 0.050]
A3	0.9933	[0.950, 1.050]	-0.0067	[-0.050, 0.050]
A4	0.9845	[0.950, 1.050]	-0.0025	[-0.050, 0.050]
A5	0.9993	[0.930, 1.070]	-0.0090	[-0.050, 0.050]
Temperature	18.1713 degC			

ThruBit Density Calibration Report				
Tool Model-Serial Number:		B-PS41D		
Source Number:				
Source Type:				
Shop Calibration Performed:		Thu Dec 19 15:55:28 2013		

REFERENCE			
	Density	Units	
Aluminium	2.700	g/cc	
Magnesium	1.686	g/cc	
BACKGROUND READINGS			
Outputs	Counts	Units	Expected
SS1 Background	146.78	cps	[100.00, 186.00]
SS2 Background	39.24	cps	[27.00, 50.00]
SS3 Background	23.48	cps	[16.00, 30.00]
SS4 Background	32.50	cps	[22.00, 40.00]
SS Valley Background	4.24	cps	[0.00, 6.00]
SS Low Background	27.04	cps	[24.00, 35.00]
SS High Background	26.92	cps	[24.00, 35.00]
SS Above Background	2.09	cps	[0.00, 3.00]
LS1 Background	159.94	cps	[101.00, 187.00]
LS2 Background	42.13	cps	[26.00, 48.00]
LS3 Background	24.91	cps	[15.00, 29.00]
LS4 Background	32.37	cps	[21.00, 38.00]
LS Valley Background	4.88	cps	[0.00, 7.00]
LS Low Background	29.38	cps	[23.00, 35.00]
LS High Background	30.56	cps	[24.00, 35.00]
LS Above Background	2.23	cps	[0.00, 4.00]
ALUMINIUM BLOCK READINGS			
SS1 Aluminium	7394.36	cps	[5500.00, 10200.00]
SS2 Aluminium	3849.65	cps	[2800.00, 5200.00]
SS3 Aluminium	3299.56	cps	[2350.00, 4360.00]
SS4 Aluminium	3216.53	cps	[2260.00, 4200.00]
SS Valley Aluminium	27.33	cps	[8.00, 15.00]
SS Low Aluminium	31.45	cps	[20.00, 35.00]
SS High Aluminium	29.84	cps	[20.00, 35.00]
SS Above Aluminium	6.94	cps	[0.00, 5.00]

LS1 Aluminium	1257.38	cps	[850.00, 1570.00]
LS2 Aluminium	1144.14	cps	[780.00, 1440.00]
LS3 Aluminium	1035.53	cps	[710.00, 1300.00]
LS4 Aluminium	735.75	cps	[530.00, 990.00]
LS Valley Aluminium	6.80	cps	[1.00, 7.00]
LS Low Aluminium	29.66	cps	[20.00, 35.00]
LS High Aluminium	30.57	cps	[20.00, 35.00]
LS Above Aluminium	2.74	cps	[0.00, 4.00]

MAGNESIUM BLOCK READINGS

Outputs	Counts	Units	Expected
SS1 Magnesium	11989.57	cps	[8920.00, 16560.00]
SS2 Magnesium	6367.62	cps	[4670.00, 8670.00]
SS3 Magnesium	5234.79	cps	[3780.00, 7020.00]
SS4 Magnesium	5065.99	cps	[3670.00, 6810.00]
SS Valley Magnesium	46.05	cps	[10.00, 25.00]
SS Low Magnesium	37.78	cps	[24.00, 35.00]
SS High Magnesium	35.01	cps	[24.00, 35.00]
SS Above Magnesium	10.60	cps	[0.00, 10.00]
LS1 Magnesium	8315.83	cps	[5670.00, 10530.00]
LS2 Magnesium	7658.23	cps	[5360.00, 9950.00]
LS3 Magnesium	6666.66	cps	[4760.00, 8840.00]
LS4 Magnesium	4438.27	cps	[3400.00, 6300.00]
LS Valley Magnesium	26.39	cps	[10.00, 15.00]
LS Low Magnesium	33.26	cps	[24.00, 35.00]
LS High Magnesium	33.09	cps	[24.00, 35.00]
LS Above Magnesium	6.73	cps	[0.00, 10.00]

ALUMINIUM + Fe SLEEVE READINGS

SS1 Al + Fe	6337.52	cps	[4300.00, 8000.00]
SS2 Al + Fe	3063.86	cps	[2130.00, 4000.00]
SS3 Al + Fe	2186.37	cps	[1533.00, 2850.00]
SS4 Al + Fe	1739.54	cps	[1190.00, 2200.00]
SS Valley Al + Fe	22.55	cps	[1.00, 7.00]
SS Low Al + Fe	31.49	cps	[20.00, 35.00]
SS High Al + Fe	30.03	cps	[20.00, 35.00]
SS Above Al + Fe	4.95	cps	[3.00, 4.00]
LS1 Al + Fe	916.37	cps	[680.00, 1260.00]
LS2 Al + Fe	741.68	cps	[580.00, 1080.00]
LS3 Al + Fe	522.04	cps	[460.00, 850.00]
LS4 Al + Fe	310.78	cps	[300.00, 550.00]
LS Valley Al + Fe	5.66	cps	[1.00, 7.00]
LS Low Al + Fe	29.60	cps	[20.00, 35.00]
LS High Al + Fe	30.78	cps	[20.00, 35.00]
LS Above Al + Fe	2.48	cps	[3.00, 4.00]

RESULTS

SS BKG ATTN	2376.49	[500, 3000]
LS BKG ATTN	1863.70	[500, 3000]

RESULTS

Reference	Reading	Units
12.00	1863.69	in
9.00	2030.78	in
6.00	2193.11	in

DENSITY PRE-SURVEY CHECK Performed:

Wed Dec 31 18:00:00 1969

Outputs	Counts	Units	Expected
SS1 Background	0.00	cps	[142.38, 151.18]
LS1 Background	0.00	cps	[155.14, 164.74]
LS4 Background	0.00	cps	[30.43, 34.31]

DENSITY POST-SURVEY CHECK Performed:

Wed Dec 31 18:00:00 1969

Outputs	Counts	Units	Expected
SS1 Background	0.00	cps	[142.38, 151.18]
LS1 Background	0.00	cps	[155.14, 164.74]
LS4 Background	0.00	cps	[30.43, 34.31]

CALIPER PRE-SURVEY CHECK Performed:

Fri Jan 17 14:59:11 2014

Reference	Readings	Units	Expected
9.00	8.98	in	[8.80, 9.20]

CALIPER POST-SURVEY CHECK Performed:

Wed Dec 31 18:00:00 1969

Reference	Readings	Units	Expected
0.00	0.00	in	[-0.20, 0.20]

Compensated Neutron Calibration Report

Tool Model-Serial Number: PS-PS05N
Source Number:

Calibration Tank Temperature: 58.1 degF
Shop Calibration Performed: Sun Dec 29 12:00:56 2013

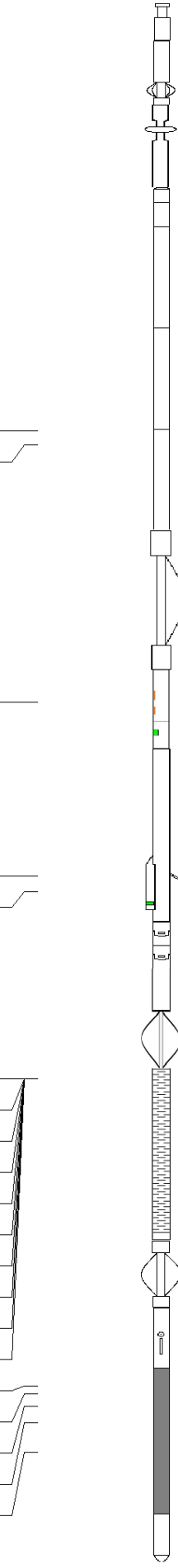
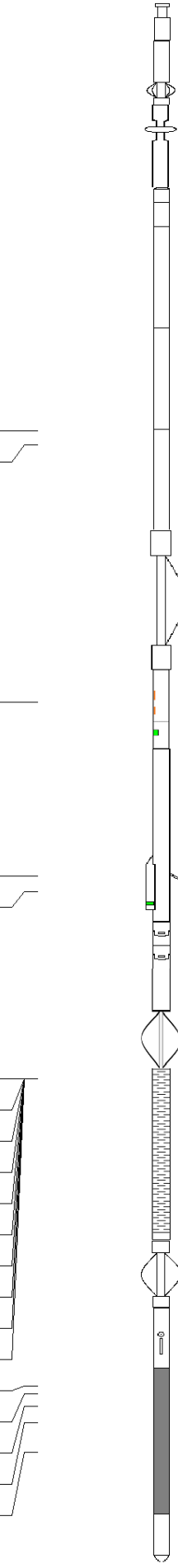
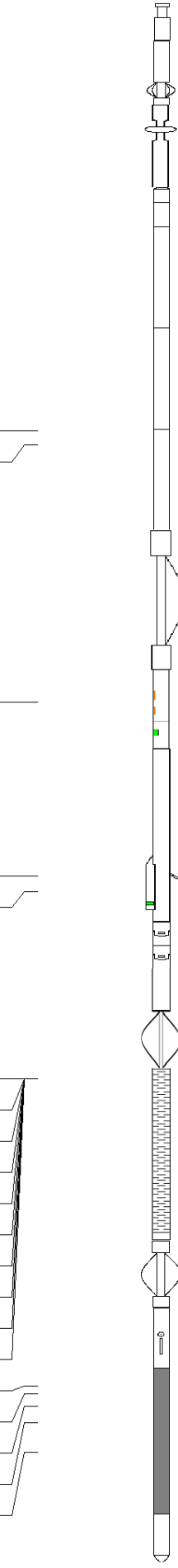
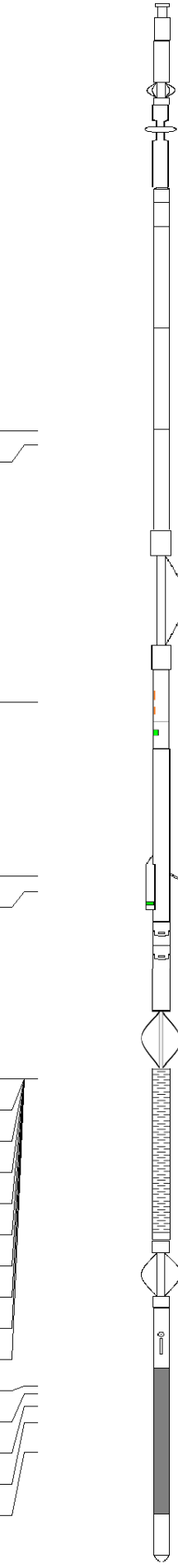
BACKGROUND MEASUREMENT

Outputs	Measured	Units	Expected
SS Counts	0.1	cps	<10
LS Counts	0.1	cps	<4

WATER TANK REFERENCE

Outputs	Measured	Units	Expected
SS Counts	2314.4	cps	
LS Counts	78.4	cps	
Tank Ratio Ref	30.9580	SS/LS	

Tank Ratio	29.5309	SS/LS			
Tank Ratio Gain	1.0483			[0.85, 1.15]	
ALUMINUM SLEEVE REFERENCE					
Outputs	Measured	Units		Expected	
SS Counts	26443.3	cps			
LS Counts	2460.6	cps			
AI Ratio Ref	10.797	SS/LS			
AI Ratio	11.266	SS/LS			
AI Ratio Gain	0.96			[0.90, 1.10]	
Sleeve Porosity	14.46	pu			
PRE-SURVEY BACKGROUND CHECK Performed: Wed Jan 15 02:05:19 2014					
Outputs	Measured	Units		Expected	
SS Counts	0.1	cps		<10	
LS Counts	0.1	cps		<4	
POST-SURVEY BACKGROUND CHECK Performed:					
Outputs	Measured	Units		Expected	
SS Counts	0.0	cps		<10	
LS Counts	0.0	cps		<4	
Gamma Ray Calibration Report					
Tool Model-Serial Number:	PS-PS10T				
Performed:	Sun Dec 29 12:09:33 2013				
Calibrator Value:	170.6	GAPI			
Background Reading:	73.9	cps			
Calibrator Reading:	499.5	cps			
Sensitivity:	0.4008	GAPI/cps			
Inclinometer Calibration Report					
Performed:	Sun Jun 13 14:33:21 1993				
	Low Read.	High Read.	Low Ref.	High Ref.	
X Accelerometer	0.00	1.00	0.00	1.00	gee
Y Accelerometer	0.00	1.00	0.00	1.00	gee
Z Accelerometer	0.00	1.00	0.00	1.00	gee

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
GR GRTEMP	68.36 67.53		Thrubit-Cablehead-S Solid Weakpoint	2.31	2.13	5.00
			Thrubit-PSBDOT	3.87	2.25	35.00
			Thrubit-HangOff_Tool	5.00	2.38	60.00
			Thrubit-10-1	0.88	2.13	3.95
			Thrubit-Universal Joint	1.46	2.06	15.00
			TBBAT-A (PS07B) Thrubit Battery	6.13	2.13	38.20
			TBBAT2-A (PS40B) Thrubit Battery	6.13	2.13	40.00
			TMG-PS (PS10T) ThruBit Telemetry Gamma Ray	6.13	2.13	45.00
			Thrubit-Decentralizer (Big)	8.45	2.13	70.00
			CNLSC	51.97		TBN-PS (PS05N) ThruBit Neutron
TBD-B (PS41D) Thrubit Density	10.48	2.13				91.00
LSW1 DCAL	41.42 40.50		Thrubit-Knuckle	1.42	2.13	11.50
			Thrubit-Knuckle	1.42	2.13	11.50
WVF7	29.17		TBS-A (TBS19) Thrubit Sonic -- Initial Support	16.46	2.13	75.00
WVF6	29.17					
WVF5	29.17					
WVF4	29.17					
WVF3	29.17					
WVF2	29.17		Thrubit-Centralizer Large Sonic Centralizer	4.08	2.13	30.00
WVF1	29.17					
RmbPk	29.17					
TT	29.17					
DT	29.17					
A1_P	10.60		TBI-PS (PS38R) Thrubit Induction	15.29	2.13	94.00
A2_P	10.10					
A3_P	9.35					
A4_P	8.35					
A5_P	6.60					

Dataset:
Total length:
Total weight:
O.D.:

diana_mem.db: field/well/proc1/pass1.3
94.25 ft
688.15 lb
2.38 in



ThruBit

A Schlumberger Company

Company	SANDRIDGE ENERGY, INC.	
Well	DIANA SWD 3305 1-36	
Field	GERBERDING	
County	HARPER	
State	KANSAS	Country USA