

# RESERVOIR MONITORING TOOL - ELITE

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<p>HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHICH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.</p>	
Comments	
GR-CBL-CAST RAN IN COMBINATION	
LOGS CORRELATED TO J-W CBL DATED 12/09/2010	
TOOLS RAN IN 5.5" 15.5 LB CASING	
GENERATOR VOLTAGE: 99V	
***THANK YOU FOR CHOOSING HALLIBURTON ENERGY SERVICES***	

Service Ticket No.	903829094	API No.	05075071820000	PGM Ver	WARRIOR 8.0
The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client					
EQUIPMENT DATA					
GAMMA		RMT		PRT	
Run No.	ONE	Run No.	ONE	Run No.	ONE
Serial No.	12105786	Serial No.	11917924	Serial No.	614
Model No.	TTTCU-002	Model No.	RMTI	Model No.	PRT
Diameter	1.69"	Diameter	2.75"	Diameter	1.69"
LOGGING DATA					
General Data					
Pass	Depths		Well Head	Speed	Logging Run Comments
No	From	To	Pressure	Ft/Min	

No.	FROM	TO	Pressure	TEMP				
ONE	2574'	200'	0	15				
	GAMMA		SIGMA					
Pass	Scale		Scale		Scale		Scale	
No.	L	R	L	R	L	R	L	L
ONE	0	150	60	0				
DIRECTIONAL INFORMATION								
Maximum Deviation			deg. @		KOP			

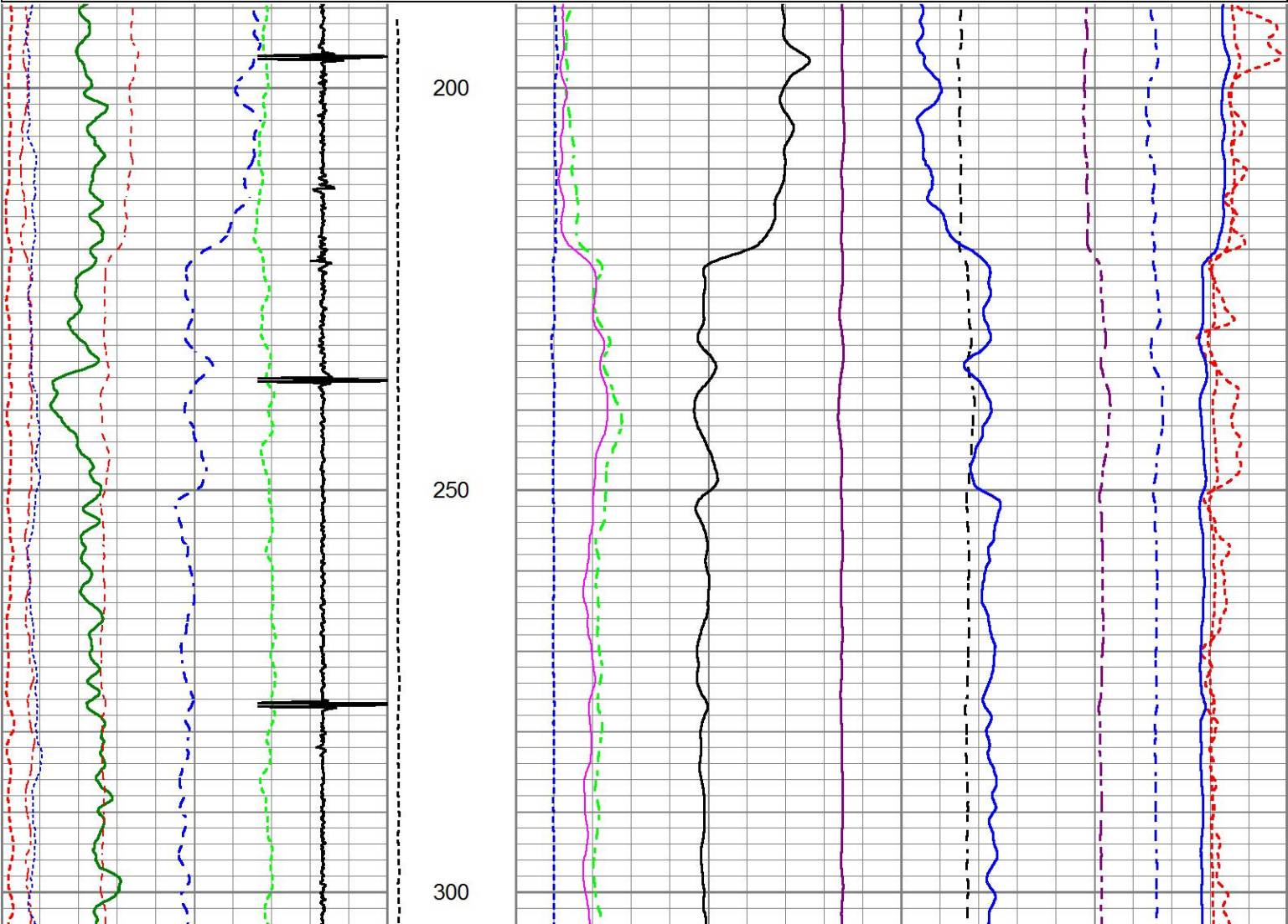
MAIN PASS

HALLIBURTON

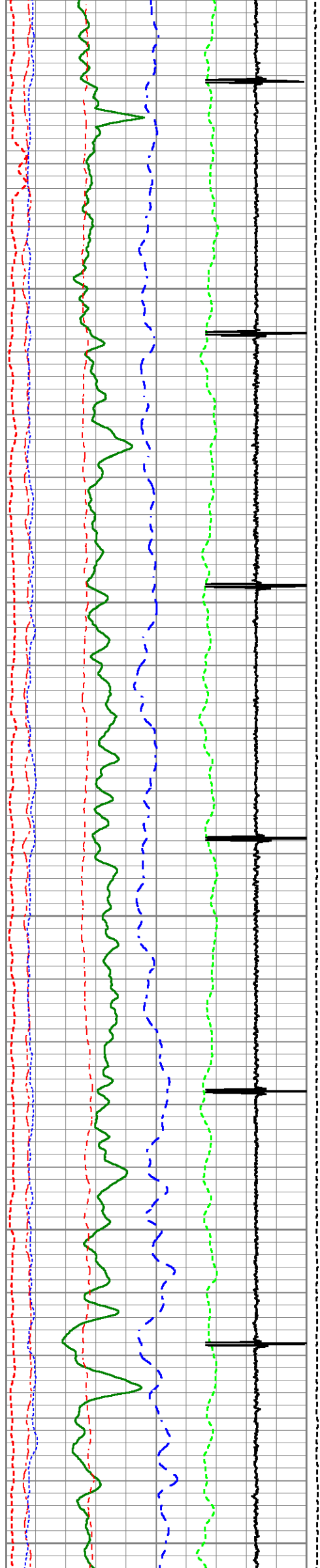
5" = 100'

Database File	ecgs_gillham_6.db
Dataset Pathname	RMT_MAIN
Presentation Format	IRMTE_~1
Dataset Creation	Wed Feb 08 11:28:08 2017
Charted by	Depth in Feet scaled 1:240

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)		1.22
0	OAI	100	0 (lb 1750	60	SGIN		0
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000 Near Counts (NCAP)
0	GR (GAPI)	150		0	RICF	6	60000 Far Counts (FCAP)
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1	100000 FAR INTEL CT (FSIN)
2500	CCL	-500		0	H YIELD (YH1)	1	10000(NEAR INTEL CT (NSIN)
0	IN FIT ERR (CFTR1) NEAR	1		0.3	PHIT ( )	-0.1	ET INL NEAR (NNII
0	IN FIT ERR CFTR2) FAR	1			INOX2		50000 -1000
					-1500	1500	







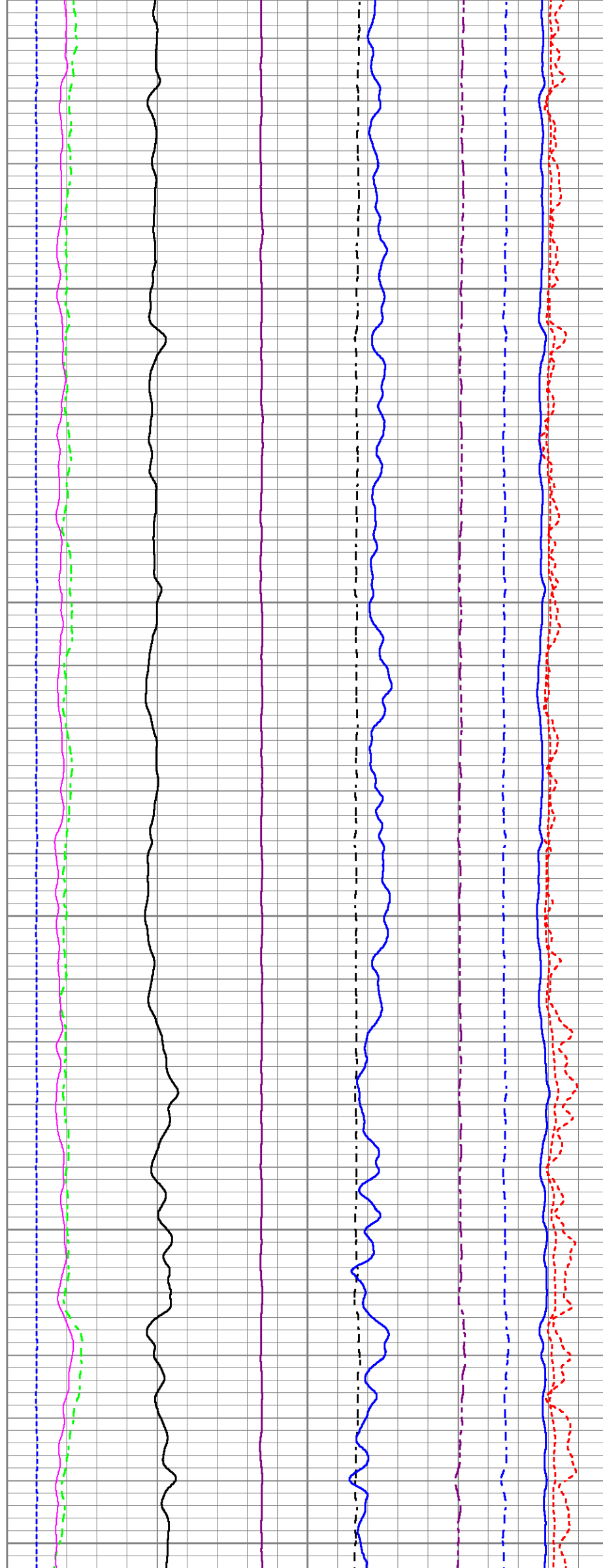
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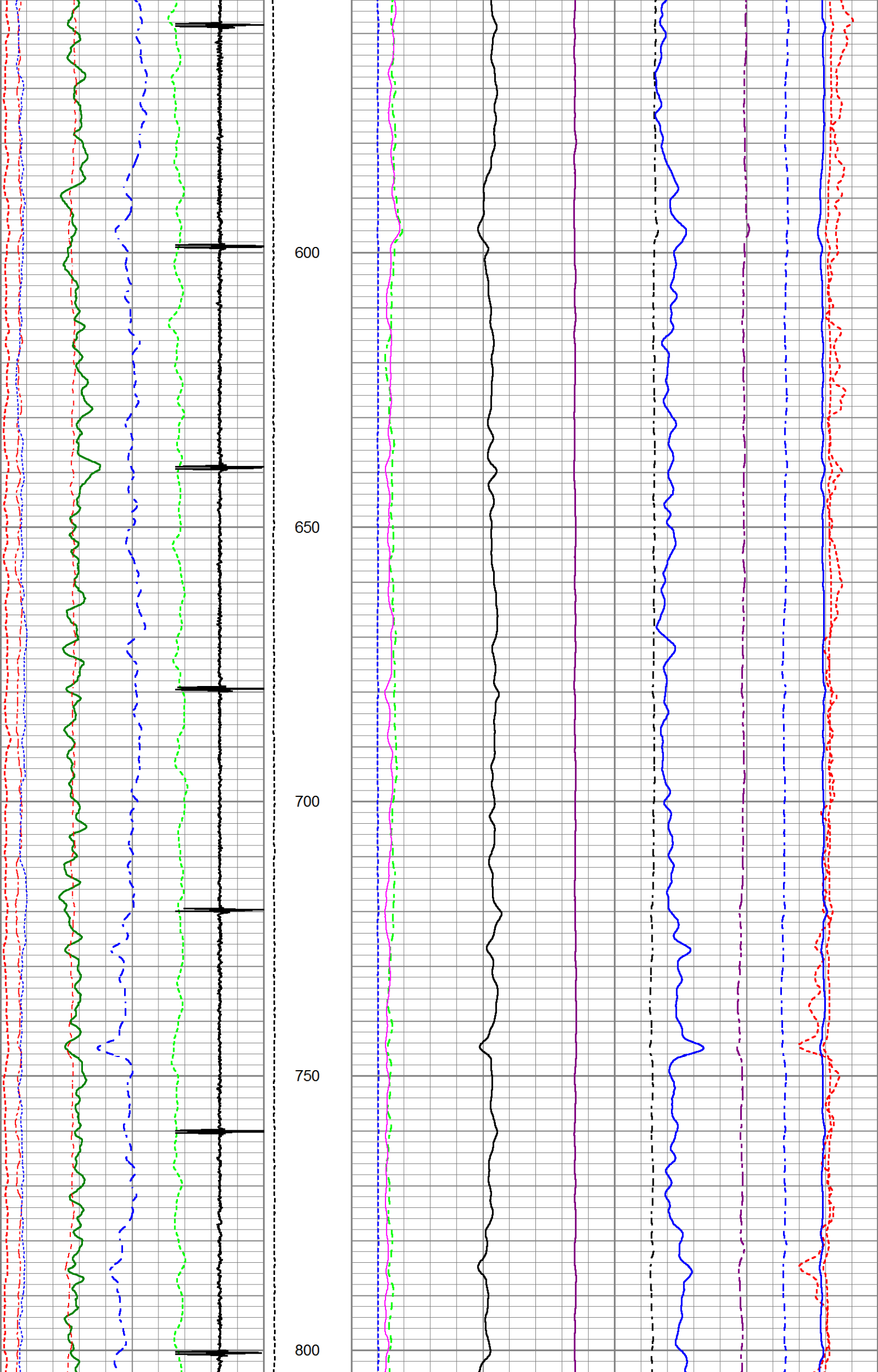
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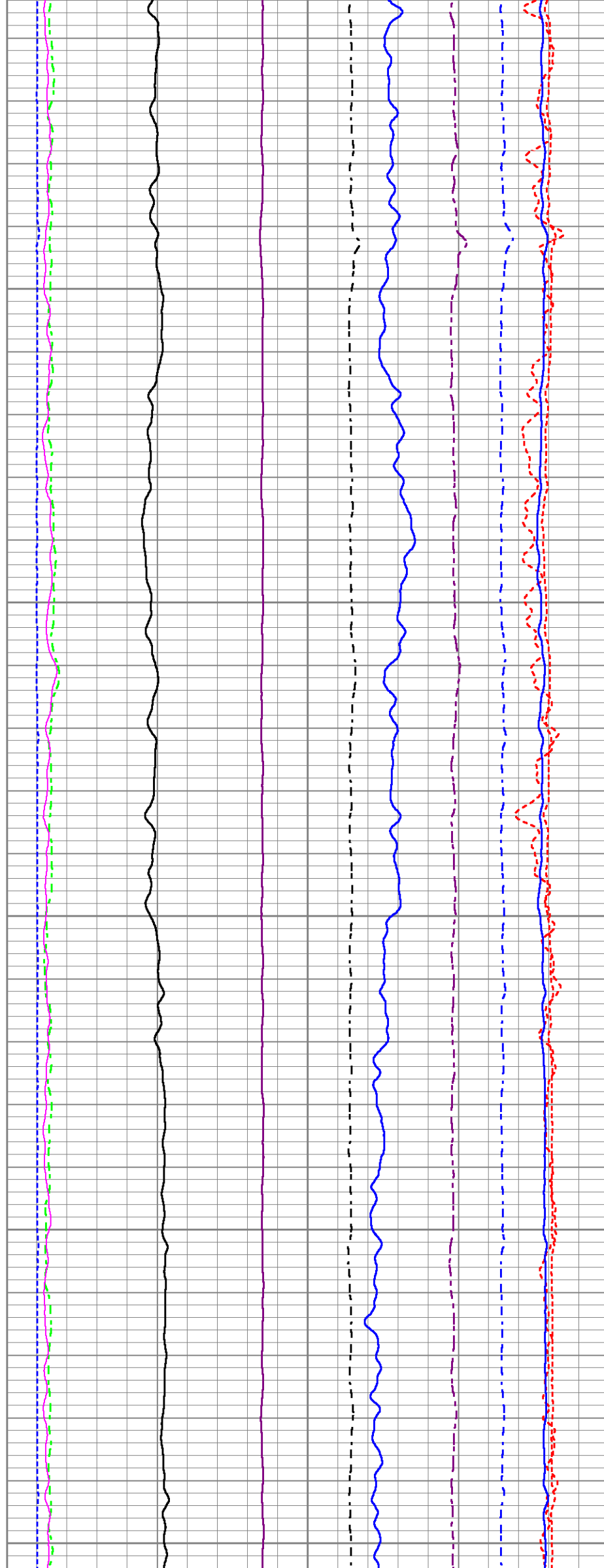
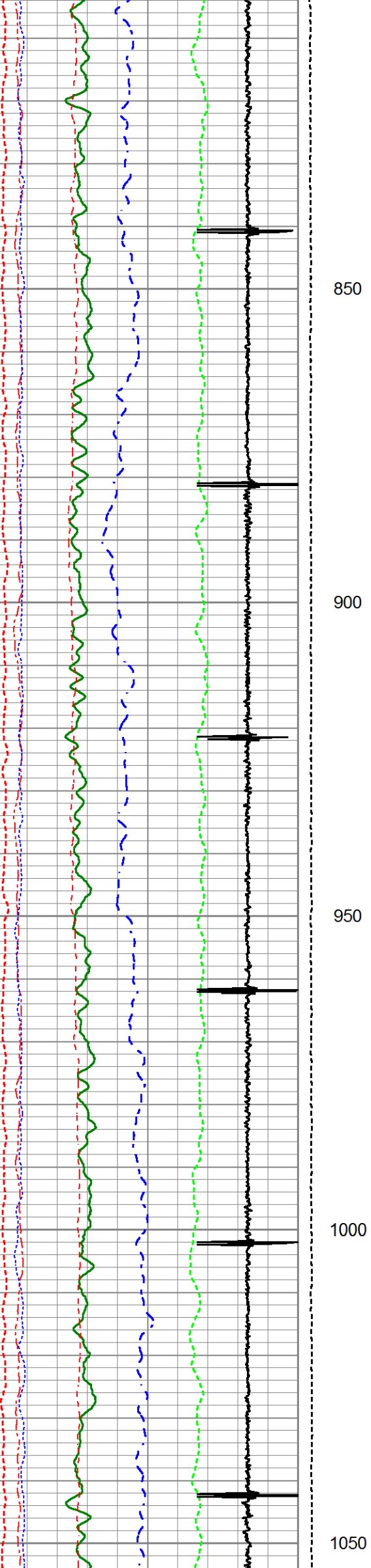
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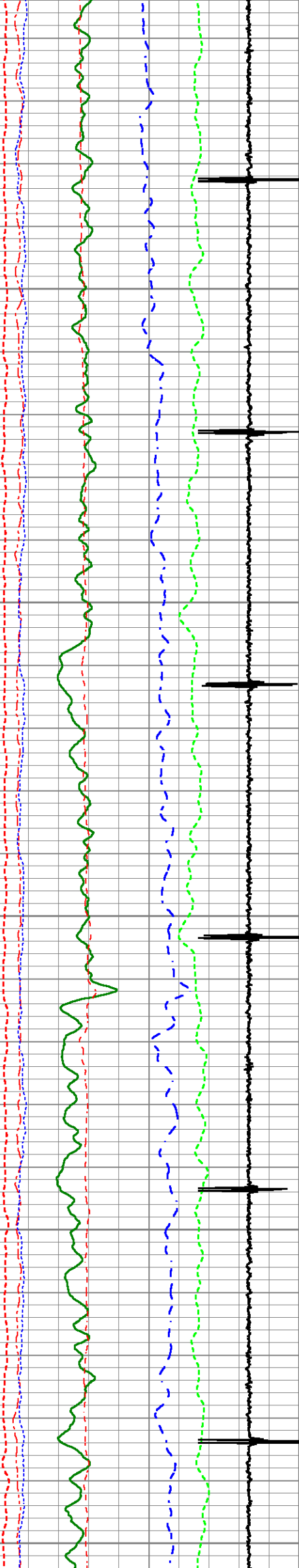
500

550









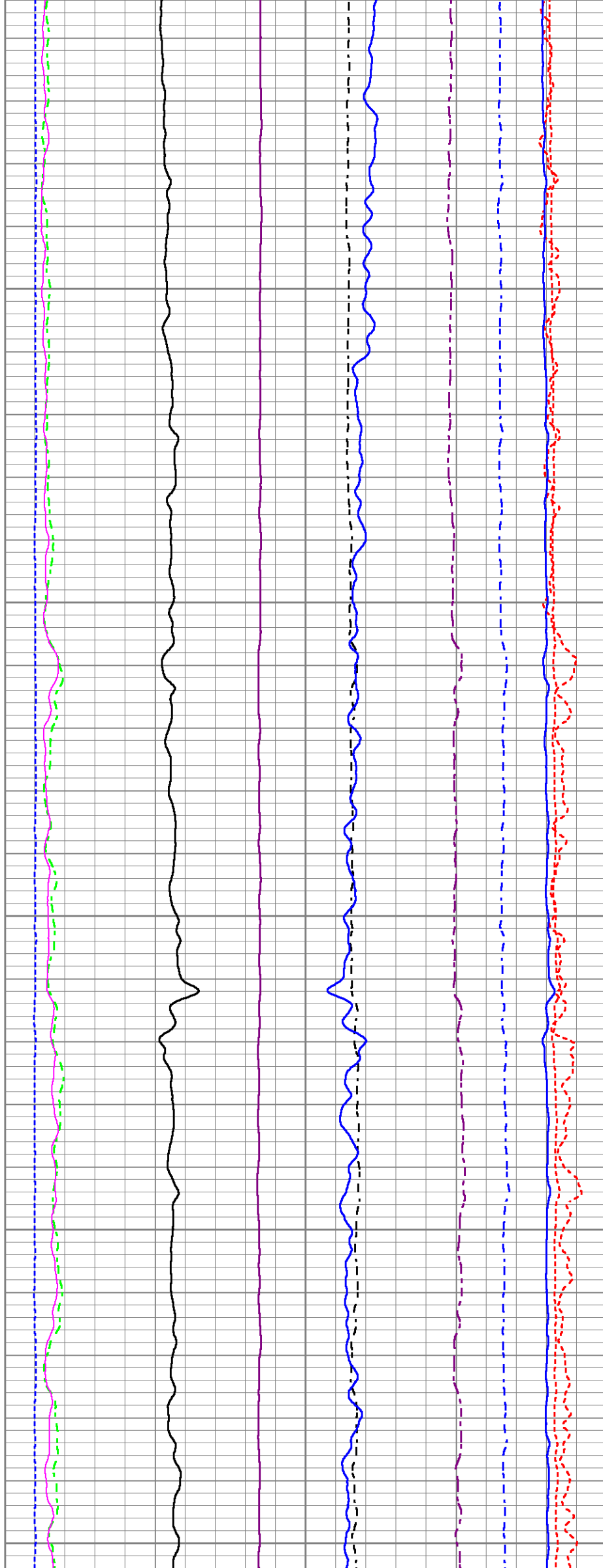
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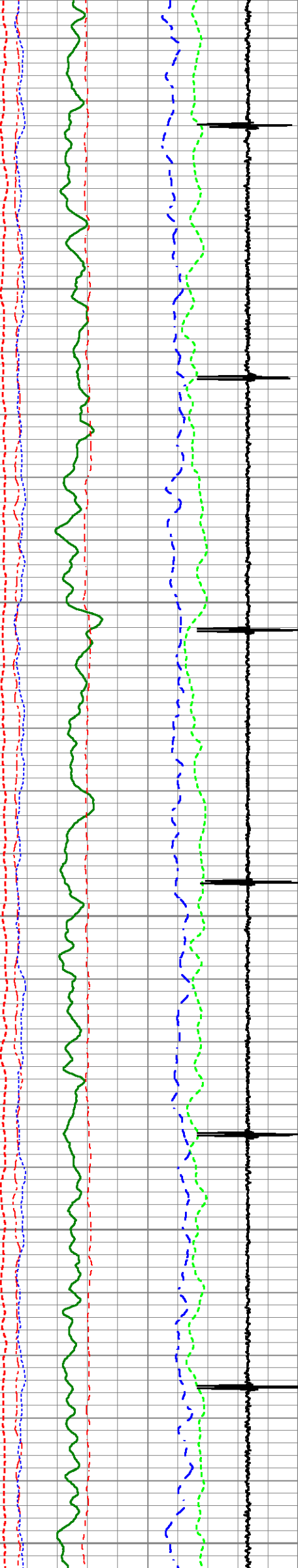
1150

1200

1250

1300





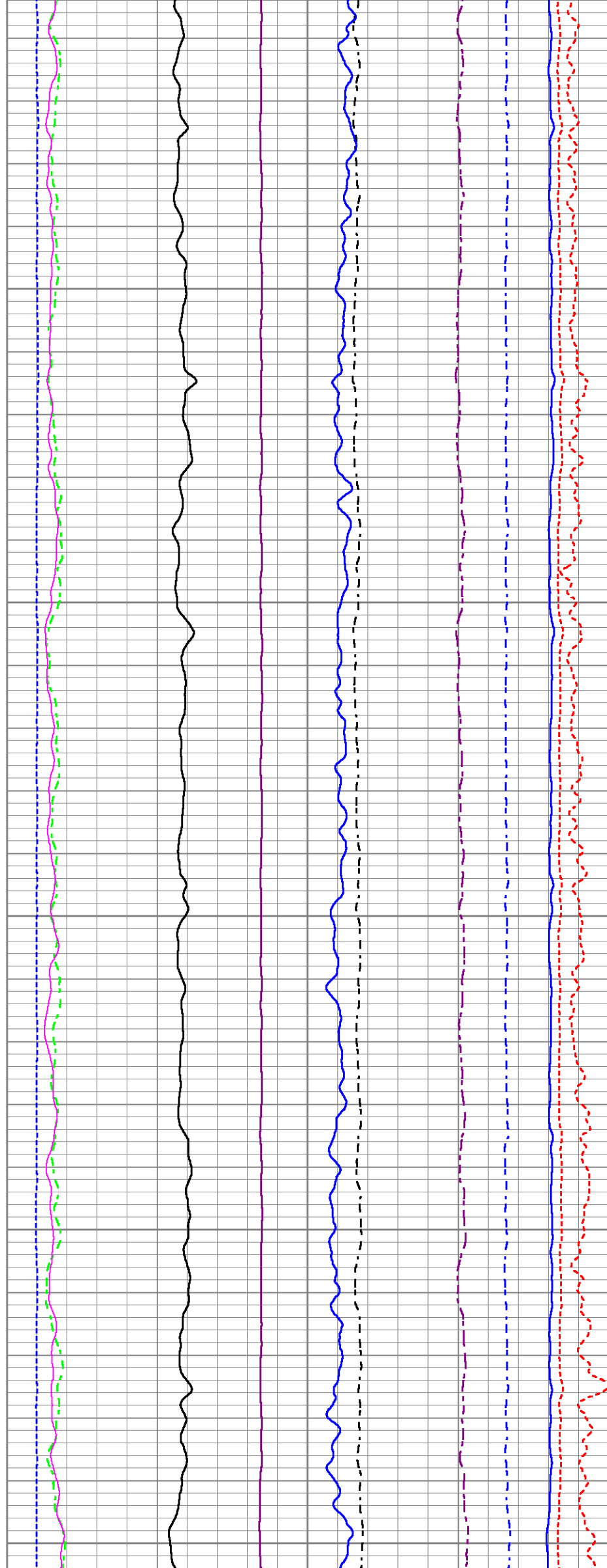
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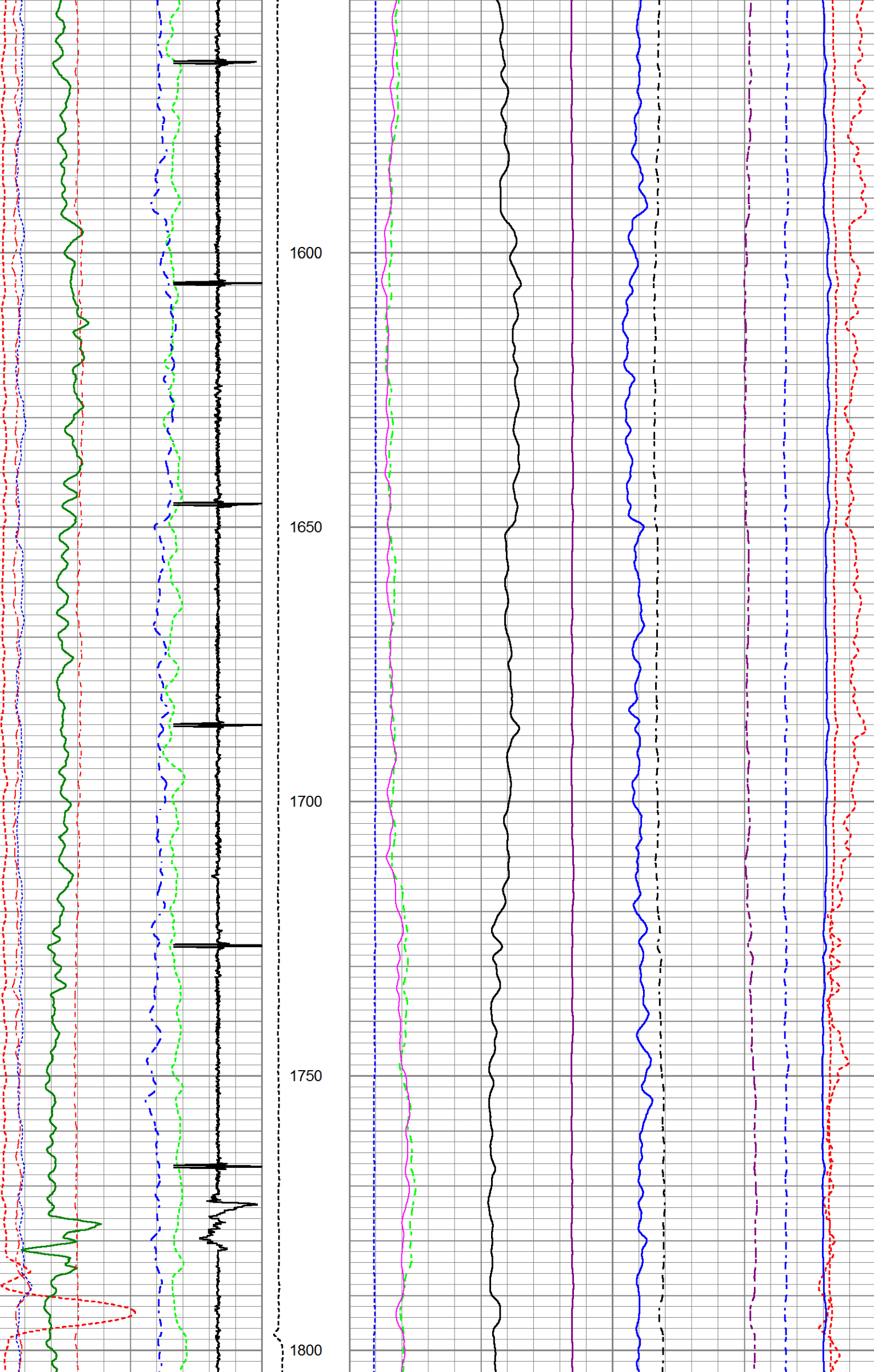
1400

1450

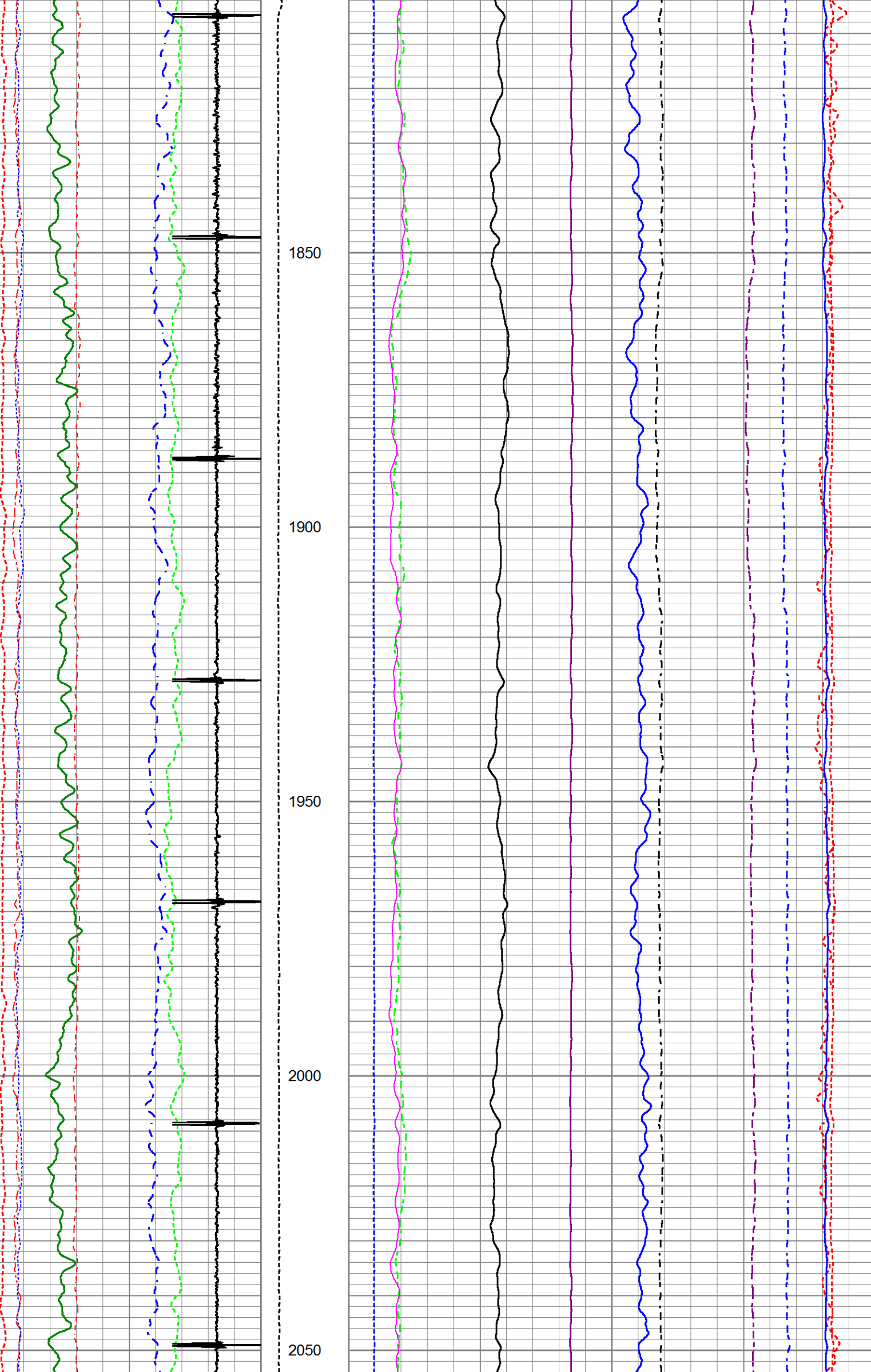
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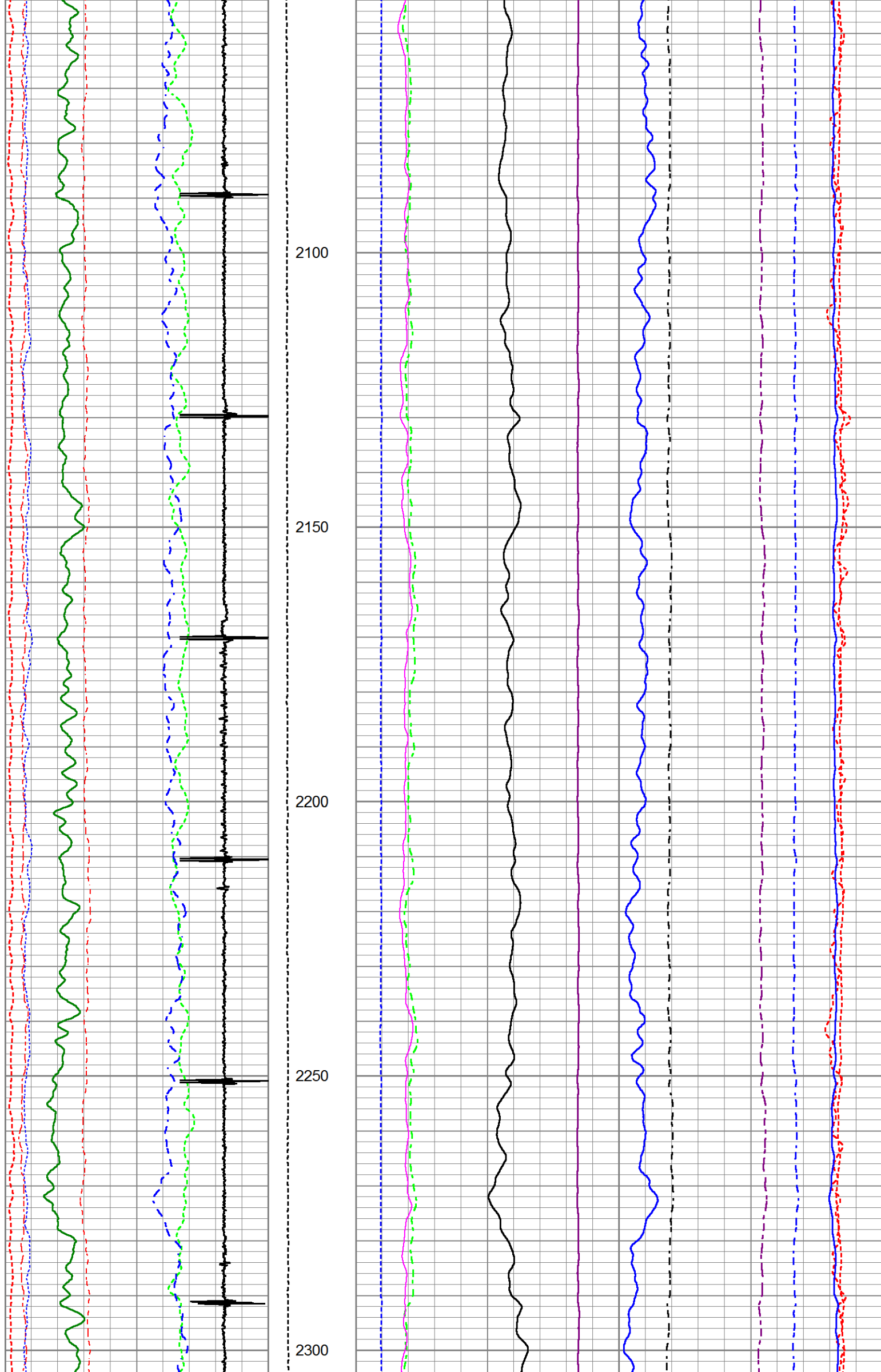
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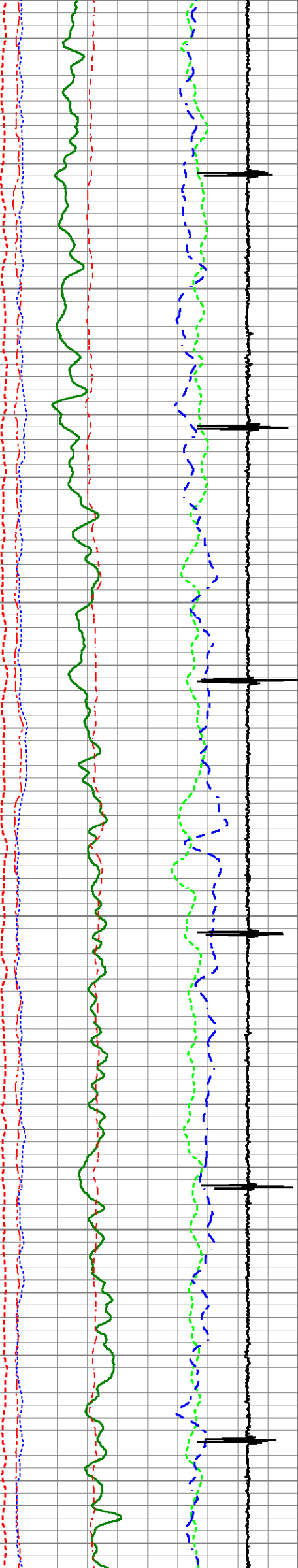












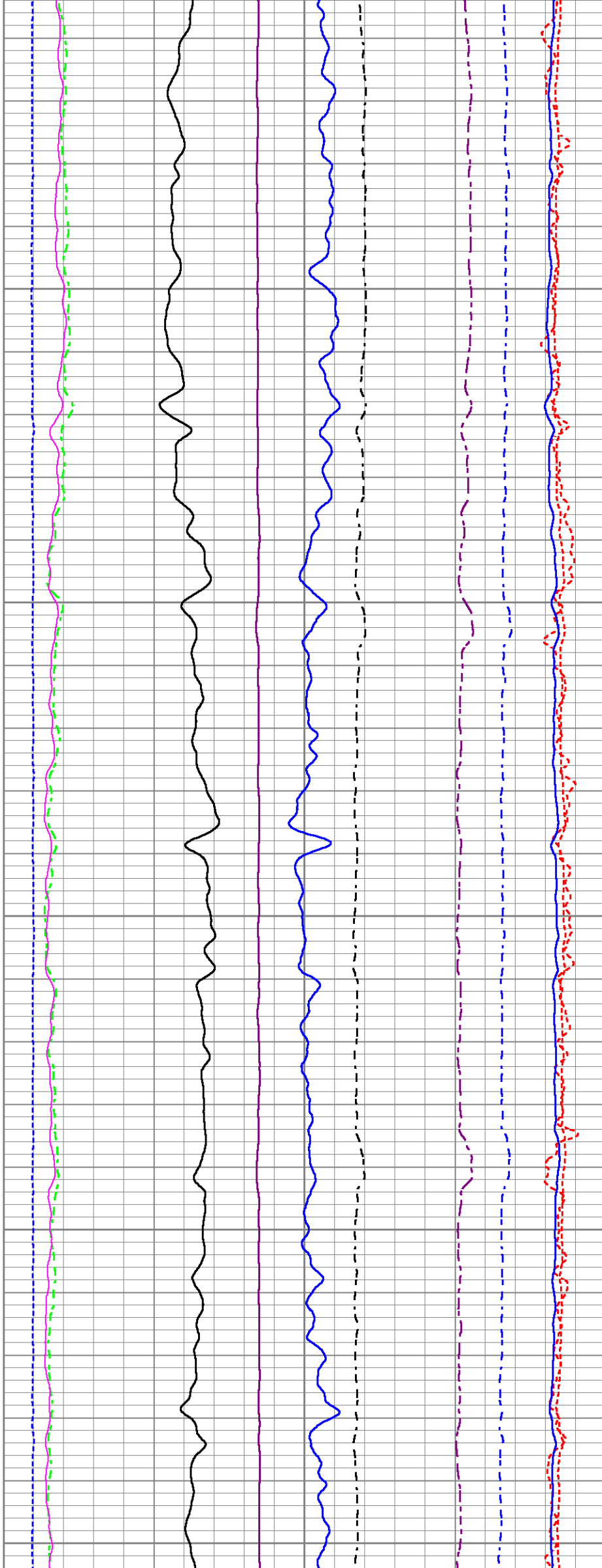
2350

2400

2450

2500

2550





200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)	1.22
0	OAI	100	0 (lb 1750)	60	SGIN	0
10	FAR FIT ERR (SGFF)	40		0	RIN	9 60000 Near Counts (NCAP)
0	GR (GAPI)	150		0	RICF	6 60000 Far Counts (FCAP)
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1 100000 FAR INTEL CT (FSIN)
2500	CCL	-500		0	H YIELD (YH1)	1 10000(NEAR INTEL CT (NSIN)
0	IN FIT ERR (CFTR1) NEAR	1		0.3	PHIT ( )	-0.1 ET INL NEAR (NNII)
0	IN FIT ERR (CFTR2) FAR	1			INOX2	50000 -1000
					-1500 1500	

MAIN PASS

5" = 100'

HALLIBURTON

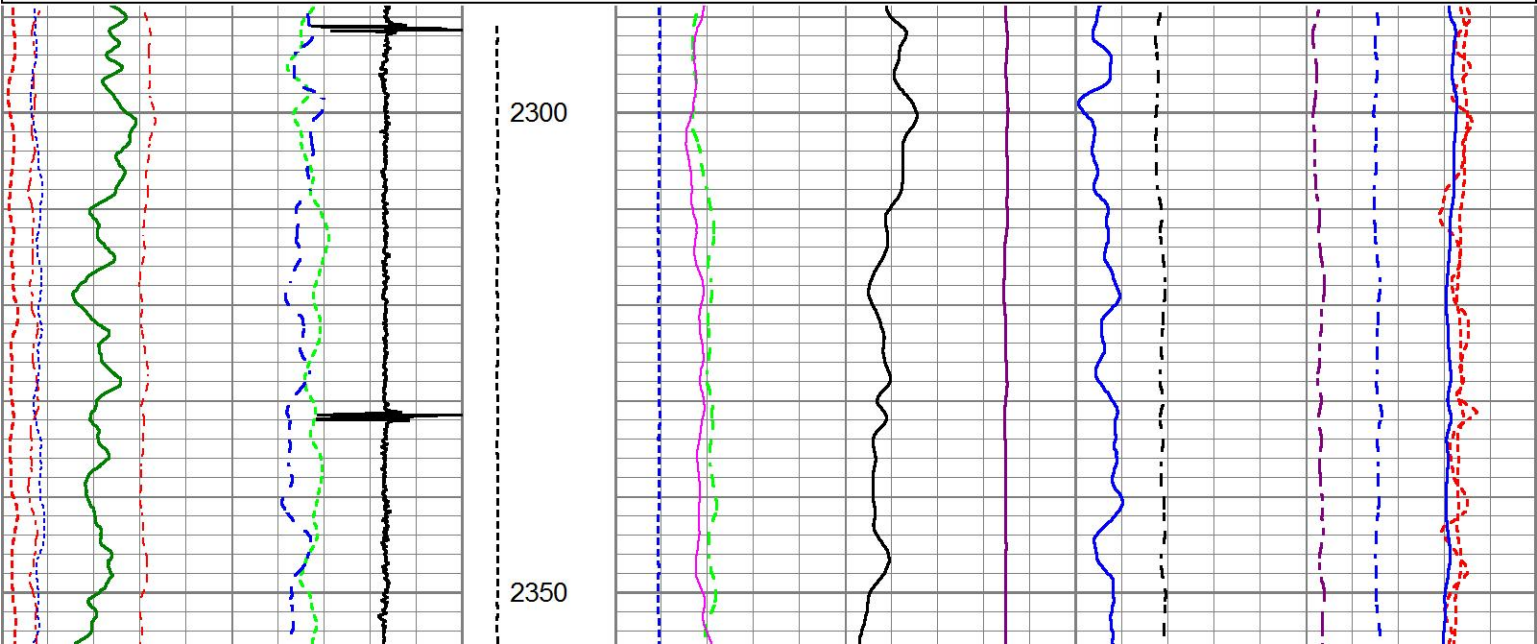
REPEAT PASS

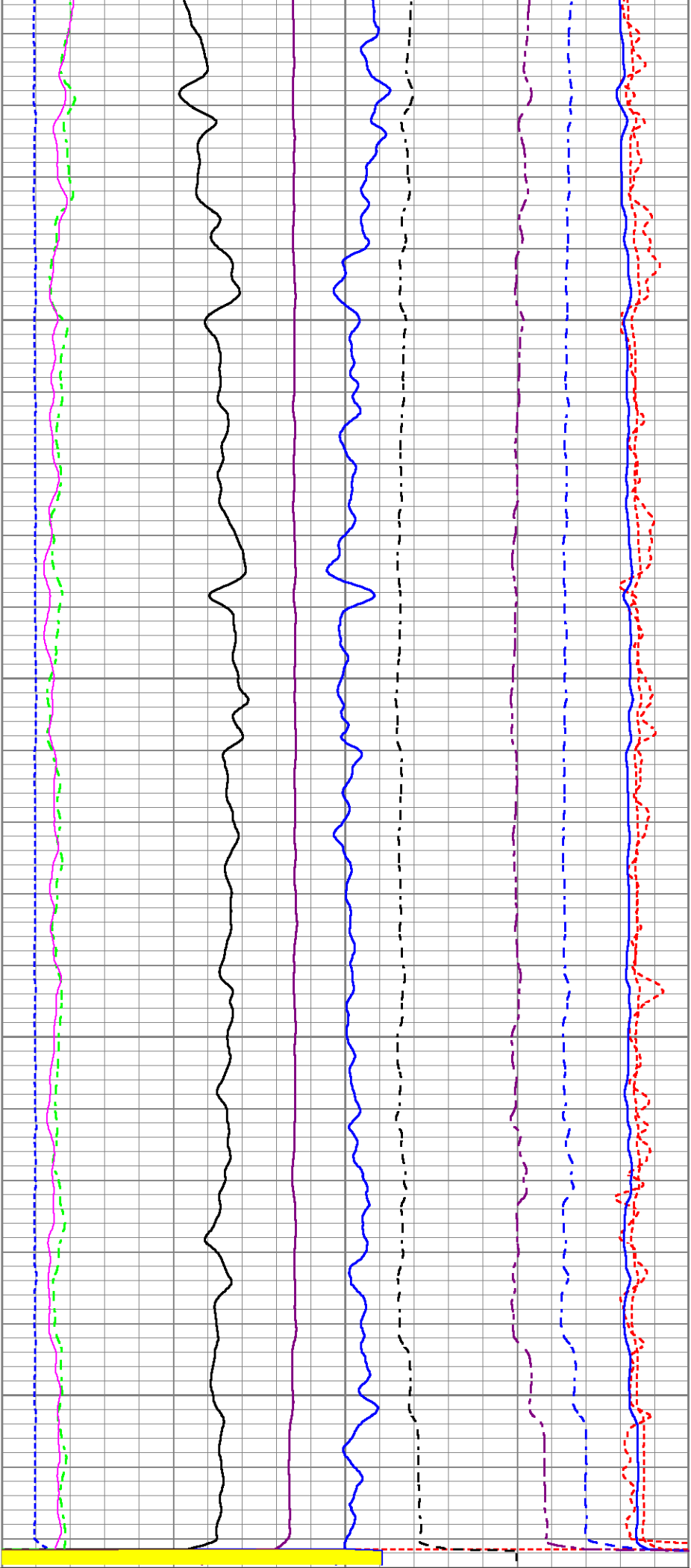
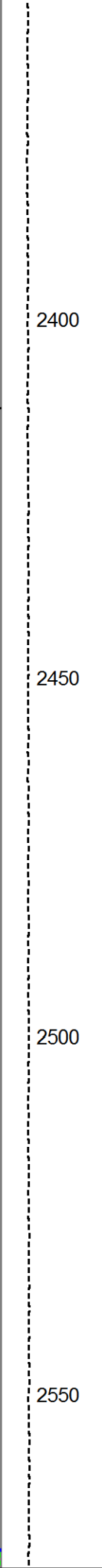
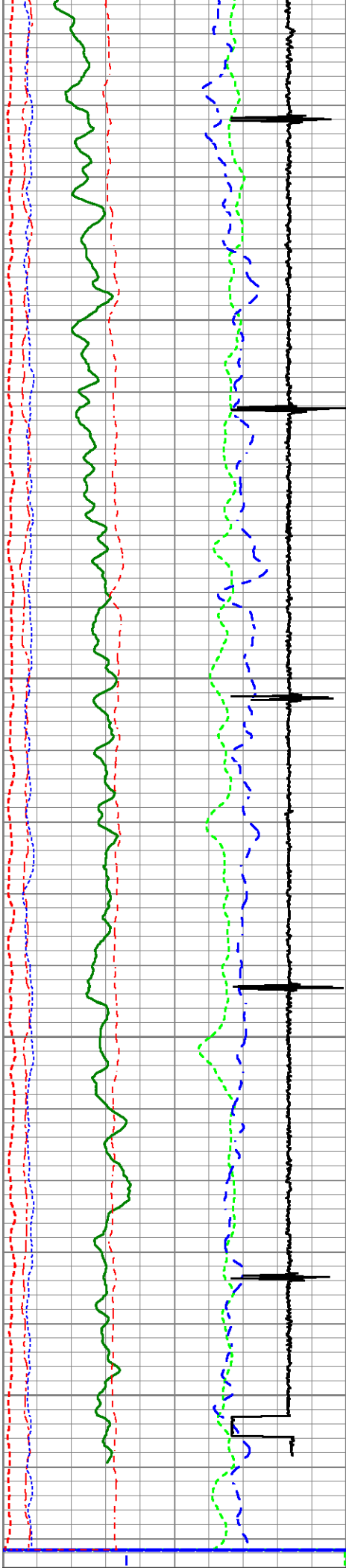
5" = 100'

HALLIBURTON

Database File ecgs\_gillham\_6.db  
Dataset Pathname RMT\_RPT  
Presentation Format !RMTE\_~1  
Dataset Creation Wed Feb 08 11:09:45 2017  
Charted by Depth in Feet scaled 1:240

200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)	1.22
0	OAI	100	0 (lb 1750)	60	SGIN	0
10	FAR FIT ERR (SGFF)	40		0	RIN	9 60000 Near Counts (NCAP)
0	GR (GAPI)	150		0	RICF	6 60000 Far Counts (FCAP)
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1 100000 FAR INTEL CT (FSIN)
2500	CCL	-500		0	H YIELD (YH1)	1 10000(NEAR INTEL CT (NSIN)
0	IN FIT ERR (CFTR1) NEAR	1		0.3	PHIT ( )	-0.1 ET INL NEAR (NNII)
0	IN FIT ERR (CFTR2) FAR	1			INOX2	50000 -1000
					-1500 1500	





200	Near Bore Si (SGBN)	0	TENSION	0	RATIO (RNF)			1.22
0	OAI	100	0 (lb 1750	60	SGIN			0
10	FAR FIT ERR (SGFF)	40		0	RIN	9	60000 Near Counts (NCAP)	0
0	GR (GAPI)	150		0	RICF	6	60000 Far Counts (FCAP)	0
0	NEAR FIT ERR (SGFN)	100		0	H YIELD (YH2)	1	100000 FAR INTEL CT (FSIN)	0
2500	CCL	-500		0	H YIELD (YH1)	1	10000(NEAR INTEL CT (NSIN)	0
0	IN FIT ERR (CETR1) NEAR	1		0.3	PHIT ( )	0.1	ET INI NEAR (NNI)	



IN FIT ERR (CFTR1) NEAR		0.5	PRINT ( )	-0.1	LET INE NEAR (NNM	
0	IN FIT ERR CFTR2) FAR	1		INOX2	50000	-1000
				-1500	1500	

REPEAT PASS

HALLIBURTON

5" = 100'

Log Variables

DatabaseC:\ProgramData\Warrior\Data\ecgs\_gillham\_6.db  
Dataset field/well/run1/RMT\_MAIN/\_vars\_

Top - Bottom

BHSAL1	BHSAL2	BHTEMP_Src	BITSIZE in	BORSAL kppm	BOTTEMP degF	CASED?	CASEOD in
1	0	TEMP	7.875	150	180	Yes	7
CASETHCK in	CASEWGHT lb/ft	LTH	MSGGN	MudWgt lb/gal	PERFS	POROS1	POROS2
0.275	15.5	Sandstone	1	8.5	0	1	0
RHOFCF	SO in	SRFTEMP degF	TDEPTH ft	UHSGC	USERFTT usec/ft	ZREF MRayl	
0.25	0	40	5100	NONE	0	1.7	

Calibration Report

Database File ecgs\_gillham\_6.db  
Dataset Pathname RMT\_RPT  
Dataset Creation Wed Feb 08 11:09:45 2017

Temperature Calibration Report

Serial Number: 10000878  
Tool Model: PRT016  
Performed: Mon Feb 06 12:07:37 2017

Point #	Reading		Reference	
1	12878.00	cps	72.43	degF
2	18169.00	cps	104.72	degF
3	29571.00	cps	175.69	degF
4	41043.00	cps	247.84	degF
5	51769.00	cps	316.76	degF
6	57500.00	cps	350.85	degF
7		cps		degF
8		cps		degF
9		cps		degF
10		cps		degF

Reservoir Monitor Tool I Calibration Report

Serial-Model: 11917924-A  
Shop Calibration Performed: Mon Feb 06 13:18:58 2017

Carbon/Oxygen Mode

Stabilization

Result	Logged	Expected Value	Diff.	Tol.	Units
GENV	94.00	80.00	14.00	+/-15.00	V
ITCR2	3227	3250	-23	+/-250	cps

Near Detector

	Channel	Expected Value	Amplitude	FWHM	Tol.
	50	22000	20000	5.15	200

H	59	60 +/-2	0.0302	5.45	<6.00
Fe	206	206 +/-2	0.0978	-----	-----
NGAIN = 0.994					
NZOFF = 1.0					
Far Detector					
	Channel	Expected Value	Amplitude	FWHM	Tol.
H	60	60 +/-2	0.0411	5.38	<6.50
Fe	209	208 +/-2	0.0920	-----	-----
FGAIN = 0.993					
FZOFF = 0.7					
Flask Temperature					
43.7 degF					
Result	Logged	Expected Value	Diff.	Tol.	Units
COIR2	0.44	0.45	-0.01	+/-0.02	
LIRI2	1.37	1.36	0.01	+/-0.05	
TCCR2	4005	4000	5	+/-1000	cps
ITCR2	3188	3200	-12	+/-250	cps

Sigma Mode					
Stabilization					
Result	Logged	Expected Value	Diff.	Tol.	Units
GENV	94.00	80.00	14.00	+/-15.00	V
FCAP	10095	10000	95	+/-500	cps
Horizontal Water Tank					
Result	Logged	Expected Value	Diff.	Tol.	Units
N/F Normalizer	0.98	0.95	0.03		
N/F Inel Norm	0.63	0.61	0.02		
RNF	1.03	1.07	-0.04	+/-0.12	
RINC	1.60	1.64	-0.04	+/-0.18	
SGFN	24.07	24.00	0.07	+/-0.50	cu
SGFF	22.95	22.85	0.10	+/-0.50	cu
FSIN	23896	24000	-104	+/-2000	cps
FCAP	10105	10000	105	+/-1000	cps
NFTR	0.90			<5.00	
FFTR	0.94			<5.00	
NBKG	214			<500	cps
FBKG	129			<500	cps
RTN	0.42	0.40	0.02	+/-0.10	usec
RTF	0.46	0.40	0.06	+/-0.10	usec





Calibration Software Modules	
HRMTI Module	2015.5.4.0
RMTI Module	2015.10.16.1
Log Data Acquisition Software Modules	
HRMTI Module	2015.5.4.0
RMTI Module	2015.10.16.1

Gamma Ray Calibration Report
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Type / Serial:	002 / 12105786
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SHOP CALIBRATION		Mon Feb 06 14:47:35 2017			
	Counts/Sec.	Gain	Offset	Jig	Units
Background	43.5				cps
Calibrator	203.8				cps
		0.9981			GAPI/cps
PRIMARY VERIFICATION					
Background	42.6				cps
Calibrator	206.2				cps

Difference		163.6	GAPI
BEFORE SURVEY VERIFICATION			
Background	0.0		cps
Calibrator	0.0		cps
Difference		0.0	GAPI
AFTER SURVEY VERIFICATION			
Background	0.0		cps
Calibrator	0.0		cps
Difference		0.0	GAPI

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)
CCL	23.26		STNDCH-STND_CH 1.4375 IN CABLE HEAD	1.50	1.44	1.00
GR	21.00		TTTCU-002 (12105786) Through Tubing Telemetry Cartridge - Ultrawire	7.65	1.69	100.00
RmtTFGT RmtTNGT	10.35 9.85		XHU-003 (000001) Crossover Halliburton 1553 to Ultrawire	1.58	1.69	7.00
			RMTI-A (11917924) Halliburton RMTI Tool	14.00	2.13	77.00

				XO213TO169INV-101201435_I	0.46	2.13	5.00
RmtFP5V	2.10			AUH-001 (000001)	0.38	1.69	3.00
RmtNFwvMcsPh	2.10			Adaptor Ultrawire/Halliburton			
RmtCommFWar	2.10			PRT-PRT016 (10000878)	1.04	1.69	6.00
				UW Platinum Resistance Thermometer			
TEMP	0.37			BUL-006 (000002)	0.22	1.69	1.20
LLMTEN	0.00			Bullnose Terminator			
Dataset: ecgs_gillham_6.db: field/well/run1/RMT_MAIN Total length: 26.83 ft Total weight: 200.20 lb O.D.: 2.13 in							

Company	EAST CHEYENNE GAS STORAGE LLC				
Well	GILLHAM 6				
Field	PEETZ WEST				
County	LOGAN		State	CO	
HALLIBURTON	RESERVOIR MONITORING TOOL - ELITE				