



Multi Arm Caliper 40  
Gamma Ray / CCL

Company Antero Resources Corporation  
Well Niley Unit 1H  
Field Mountain  
County Ritchie  
State West Virginia

Company Antero Resources Corporation  
Well Niley Unit 1H  
Field Mountain  
County Ritchie  
State West Virginia

Location: API #: 47-085-10250

Latitude: 39.32291  
Longitude: -80.89909

SEC TWP RGE

Permanent Datum Ground Level Elevation 887 ft  
Log Measured From Kelly Bushing  
Drilling Measured From Kelly Bushing

Other Services  
Elevation  
K.B. 911.5 ft  
D.F. 911.5 ft  
G.L. 887 ft

Date 9 - Jan - 2018

Run Number	One			
Depth Driller	14,297 ft			
Depth Logger	6,686 ft			
Bottom Logged Interval	6,665 ft			
Top Log Interval	Surface			
Open Hole Size	na			
Type Fluid	Fresh Water			
Density / Viscosity	8.3 lb/g			
Max. Recorded Temp.	-			
Estimated Cement Top	-			
Time Well Ready	09:51			
Time Logger on Bottom	10:35			
Equipment Number	2611			
Location	Inwin, Pa			
Recorded By	Blake Fenton			
Witnessed By	Bobby Thomas			
Borehole Record		Tubing Record		
Run Number	Bit	From	To	Size
				Weight
				From
				To
Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String	13 3/8 in	48 lbs/ft	Surface	573 ft
Prot. String	9 5/8 in	36 lbs/ft	Surface	2,618 ft
Production String	5 1/2 in	23 lbs/ft	Surface	14,297 ft
Liner				

<<< Fold Here >>>

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

Caliper run with three inline bowspring centralizers  
 Logged from 6,665 ft to 4,972 ft  
 Tool zeroed at ground level and corrected 24.5 ft to KB  
 Marker Joint detected from 6,346 ft to 6,356 ft  
 Casing tally denotes marker joint from 6,352 ft to 6,362 ft  
 Marker Joint ID (4.59 in)  
 Airlock ID (5.22 in)

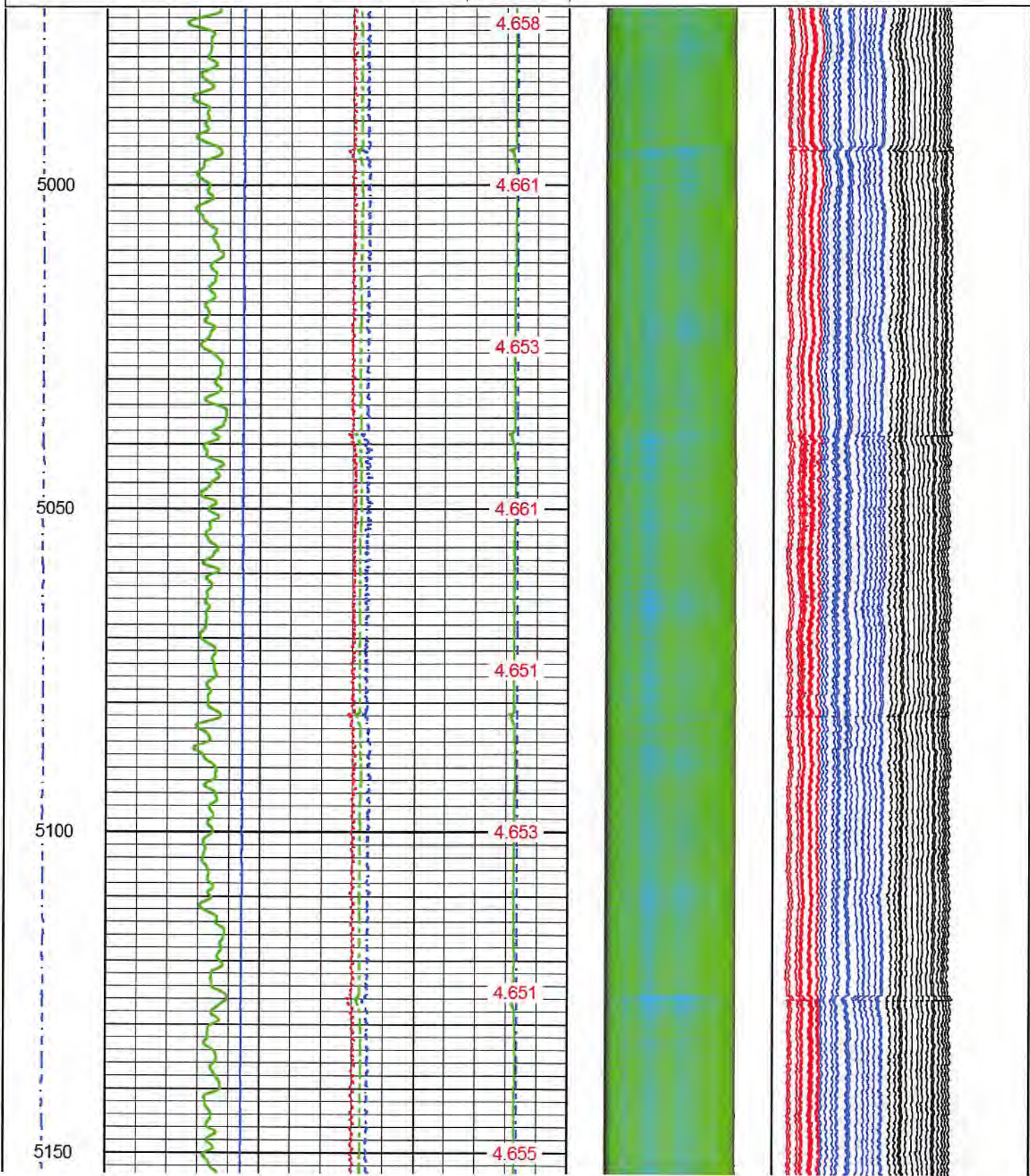


Multi Arm Caliper 40 Presentation 1

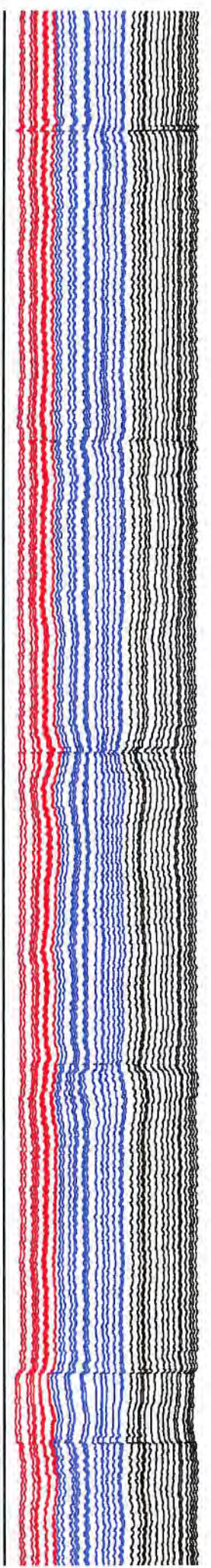
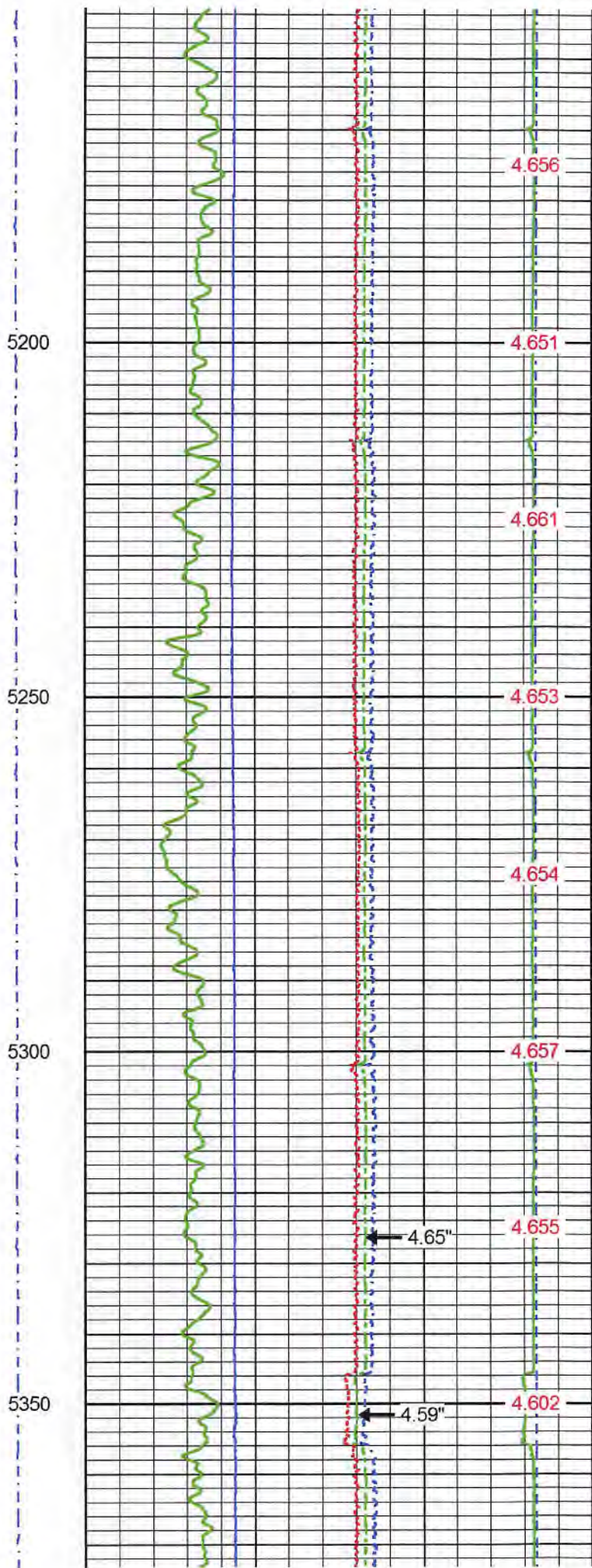
Scale 1:240

Database File 4-085-10252\_niley\_unit3h\_mac40\_01092017.db  
 Dataset Pathname MAC40/pass1st  
 Presentation Format ahwsmac  
 Dataset Creation Tue Jan 09 12:13:53 2018  
 Charted by Depth in Feet scaled 1:240

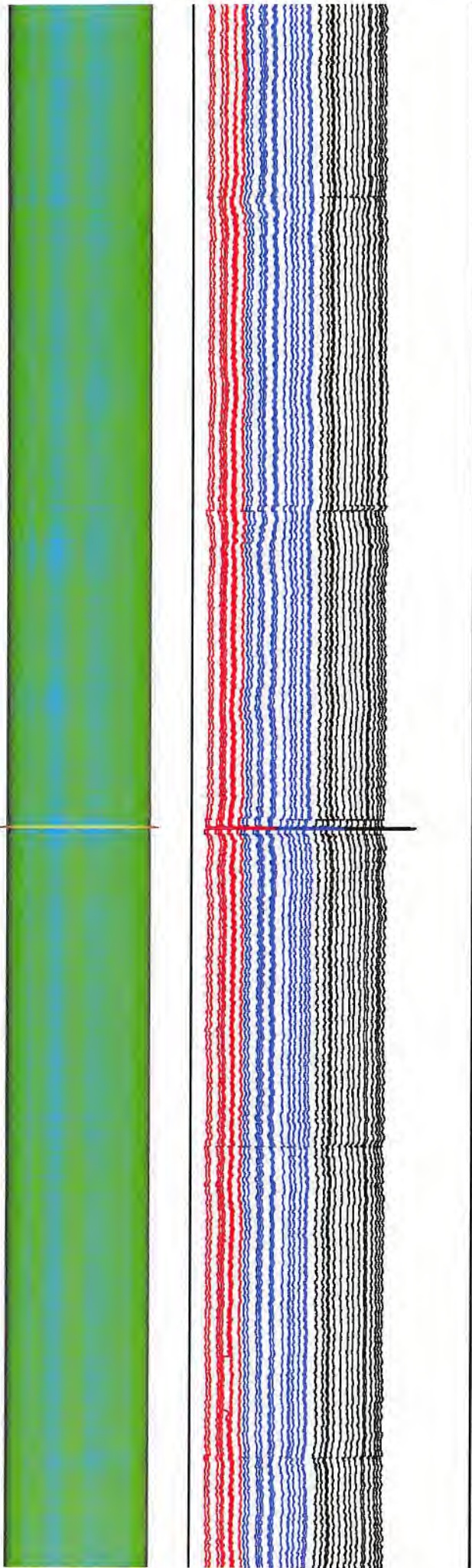
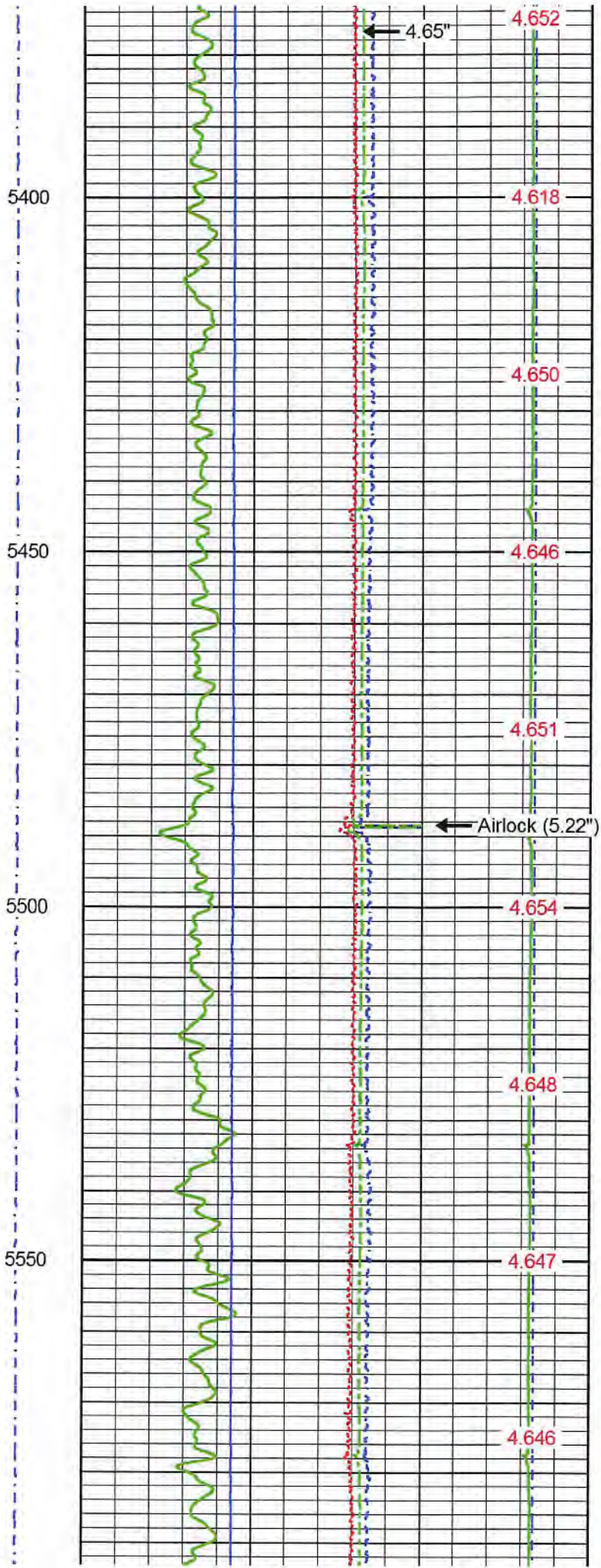
LTEN	0	GR (GAPI)200	4	MIN ID (in)	5	4	IDAV (in)	5	3D IMAGE (in)	1.198	R15 (in)	3.698
0	(lb2500)	90 DEVI (deg)	0	MAX ID (in)	5	4	NOMINAL ID	5	(in)	3.84	R30 (in)	4.298
				AVG ID (in)	5	4	(in)	5			R01 (in)	3.138
							IDAV (in)					



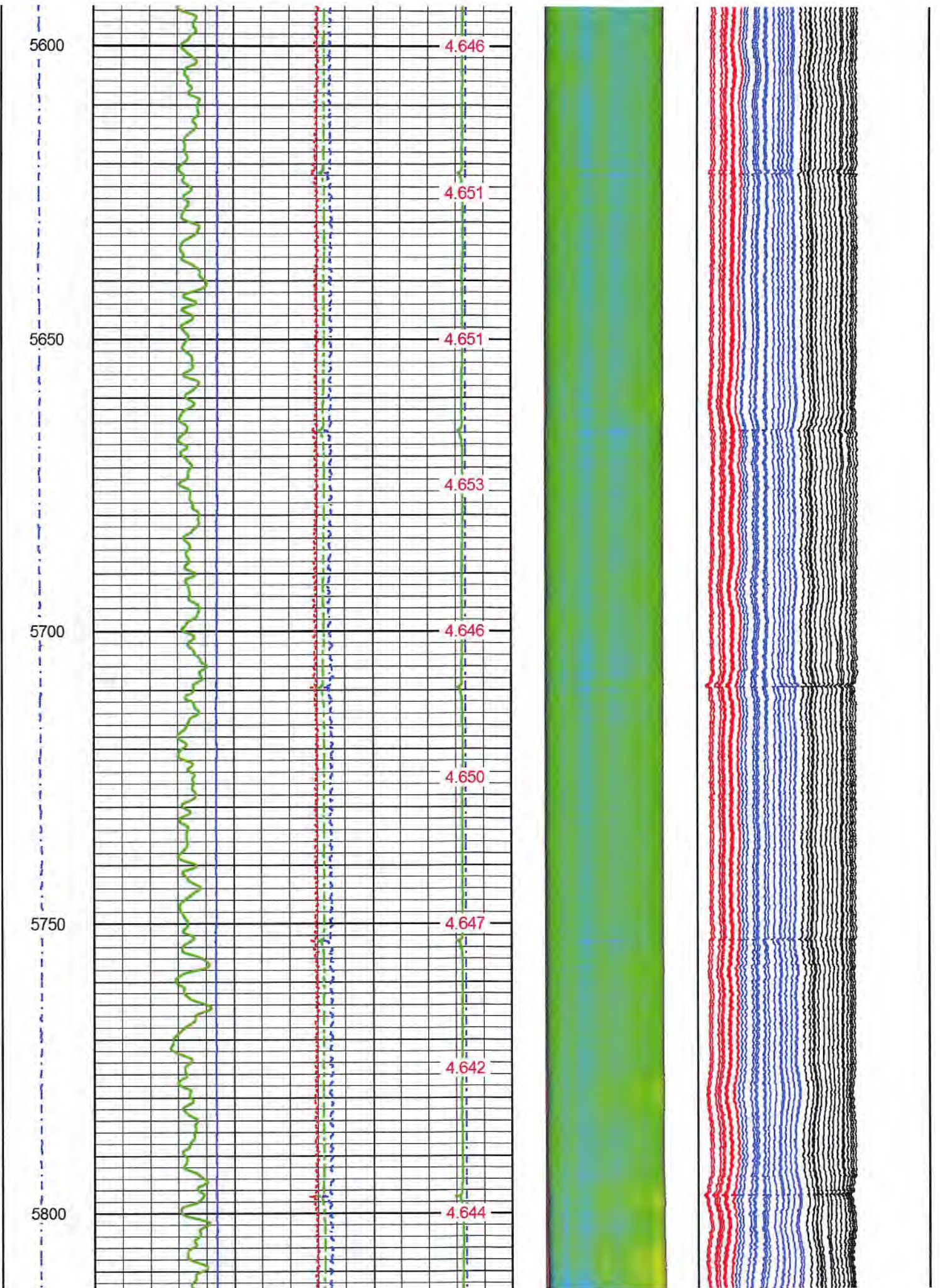




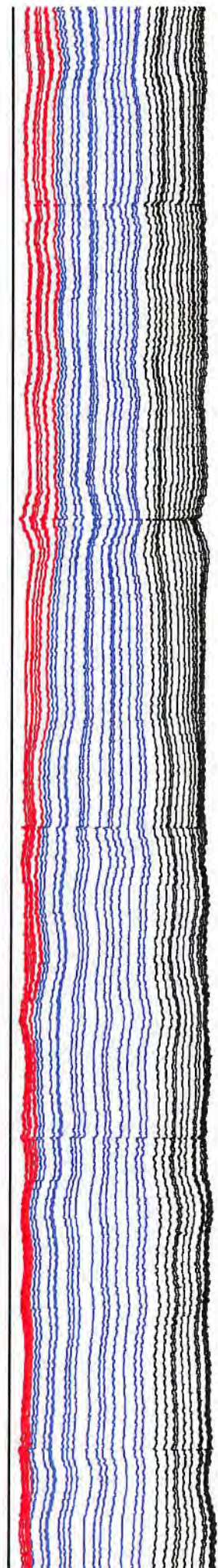
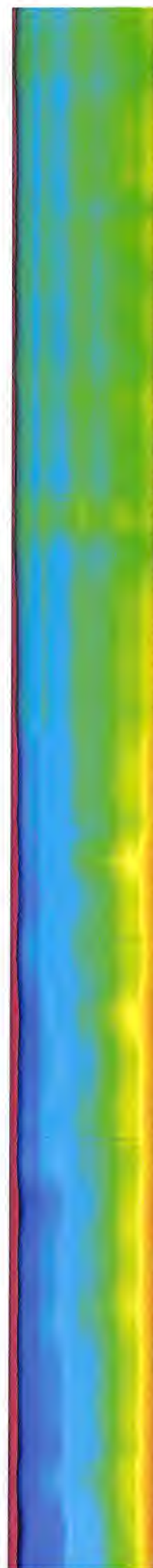
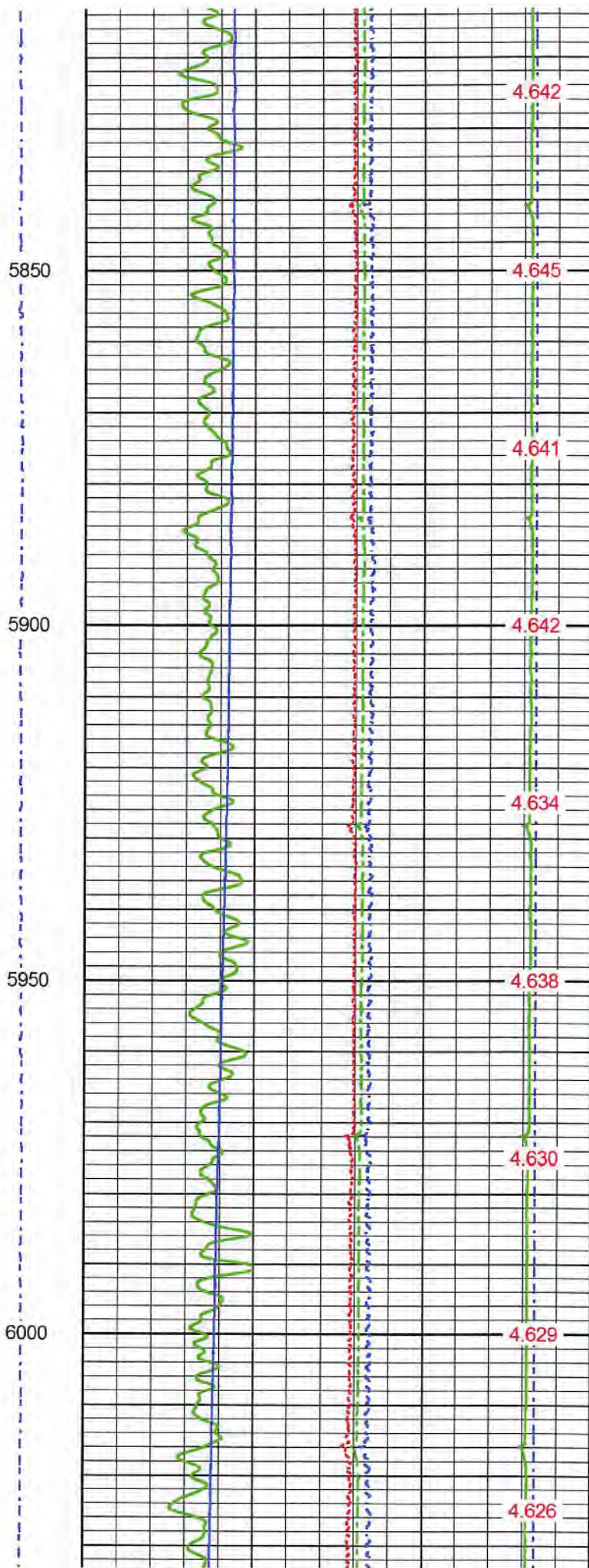














6050

6100

6150

6200

6250

4.619

4.623

4.629

4.628

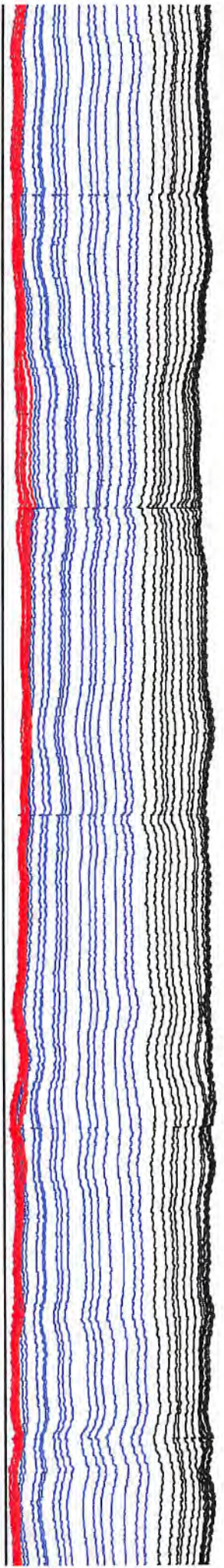
4.624

4.611

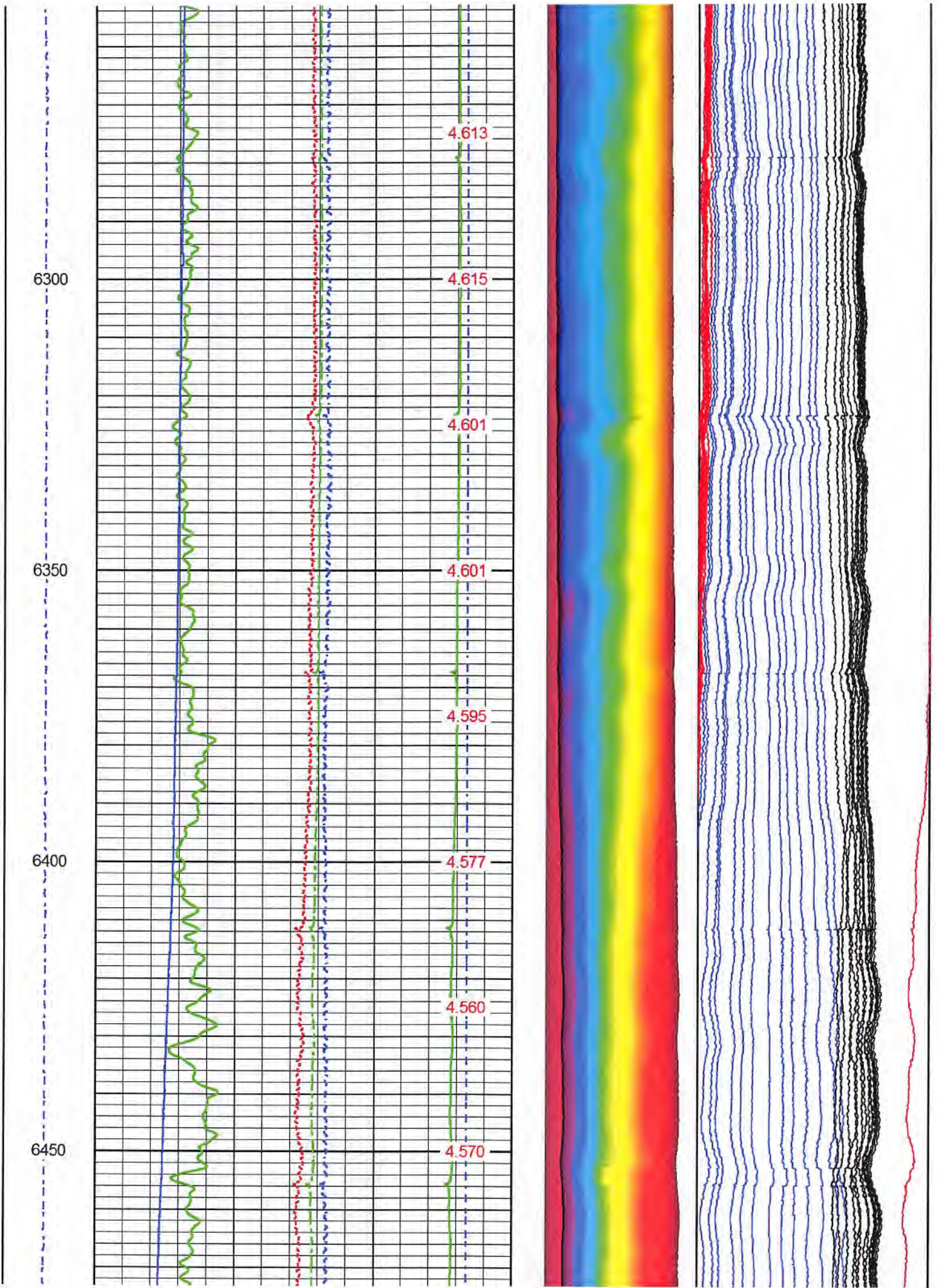
4.614

4.610

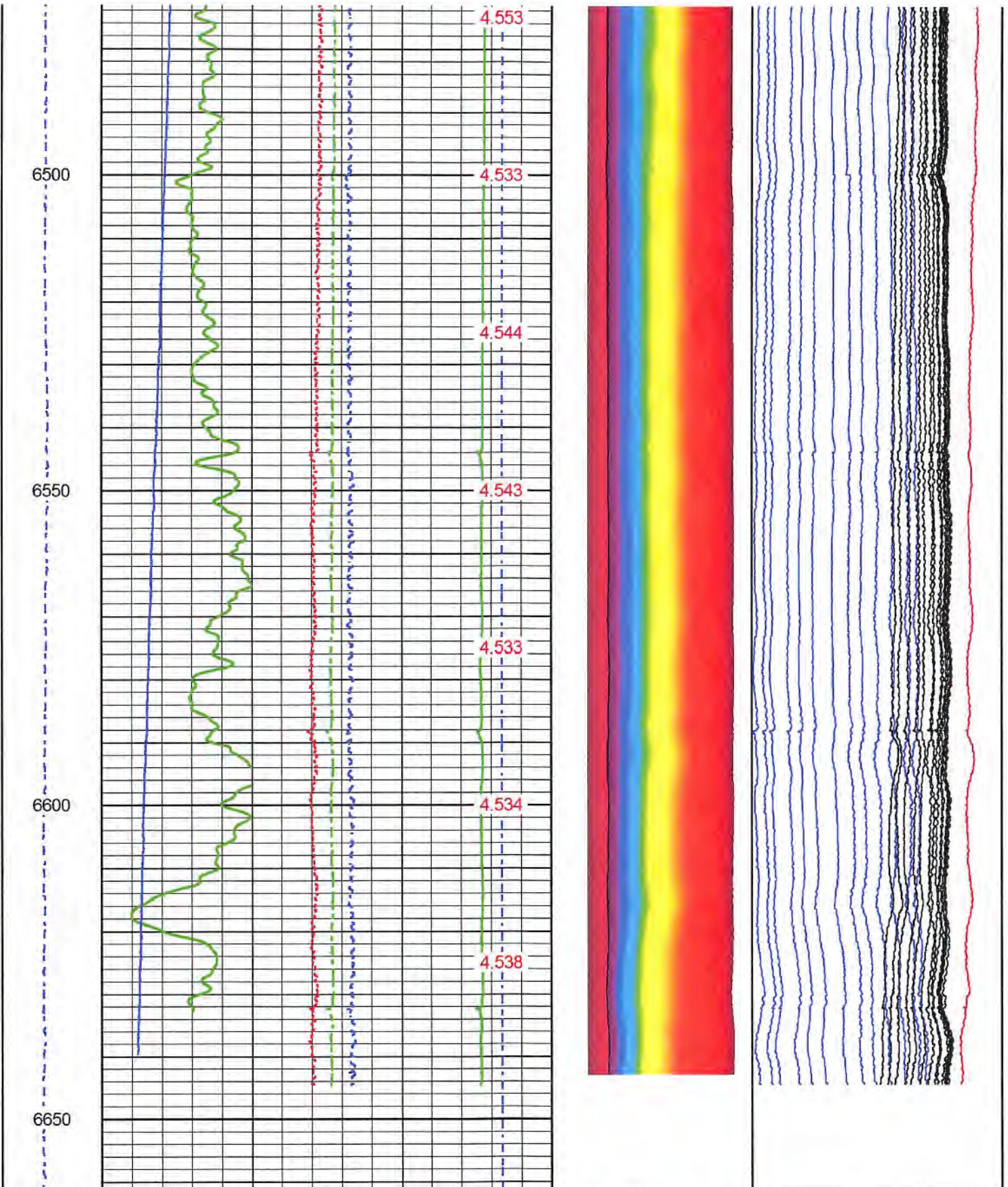
4.612









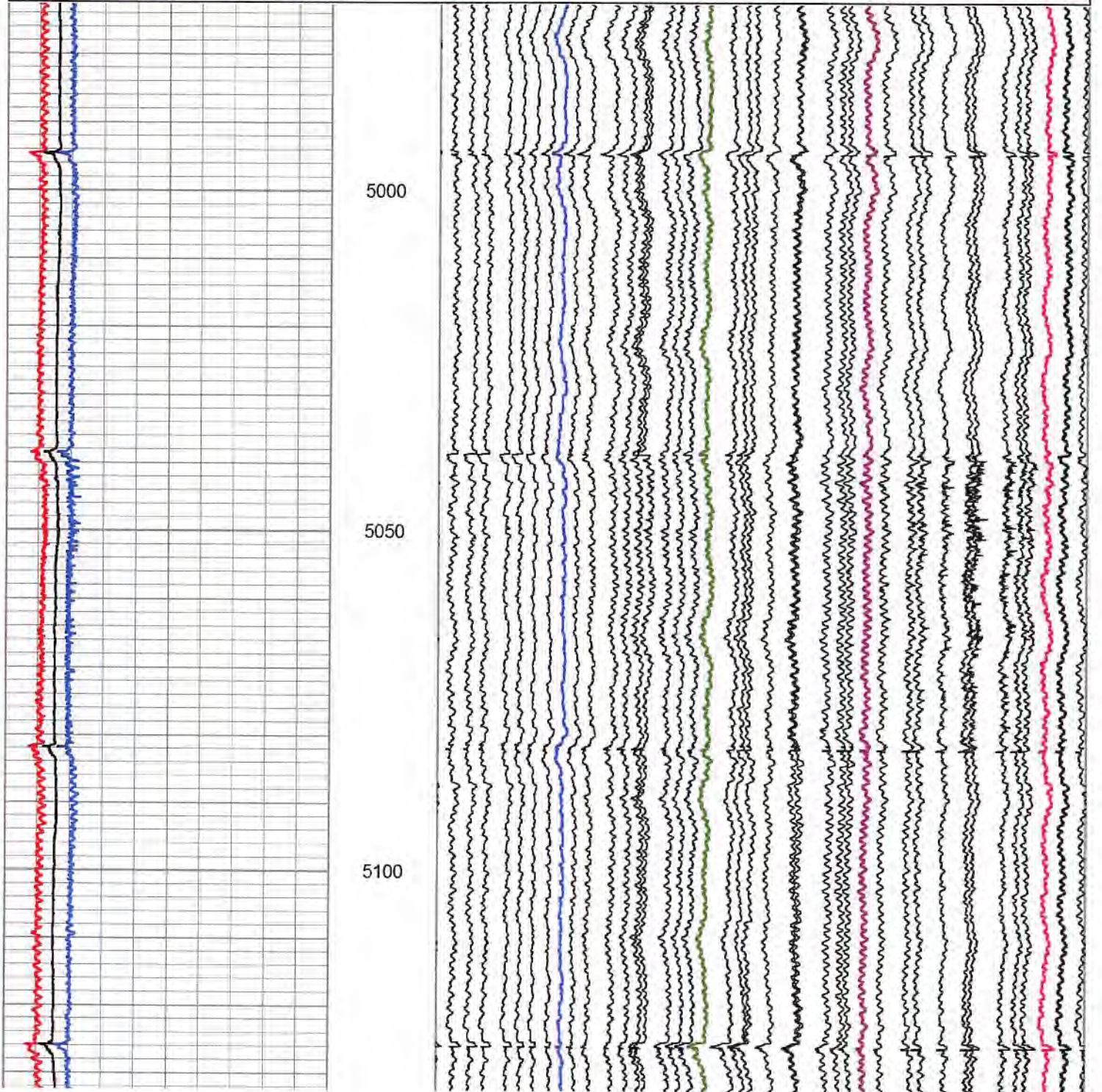


LTEN	0	GR (GAPI)200	4	MIN ID (in)	5	4	IDAV (in)	5	3D IMAGE (in)	1.198	R15 (in)	3.698	
0	(lb2500	90 DEVI (deg)	0	MAX ID (in)	5		NOMINAL ID	3.84	(in)	5.5	1.798	R30 (in)	4.298
			4	AVG ID (in)	5	4	(in)				0.638	R01 (in)	3.138
							IDAV (in)						

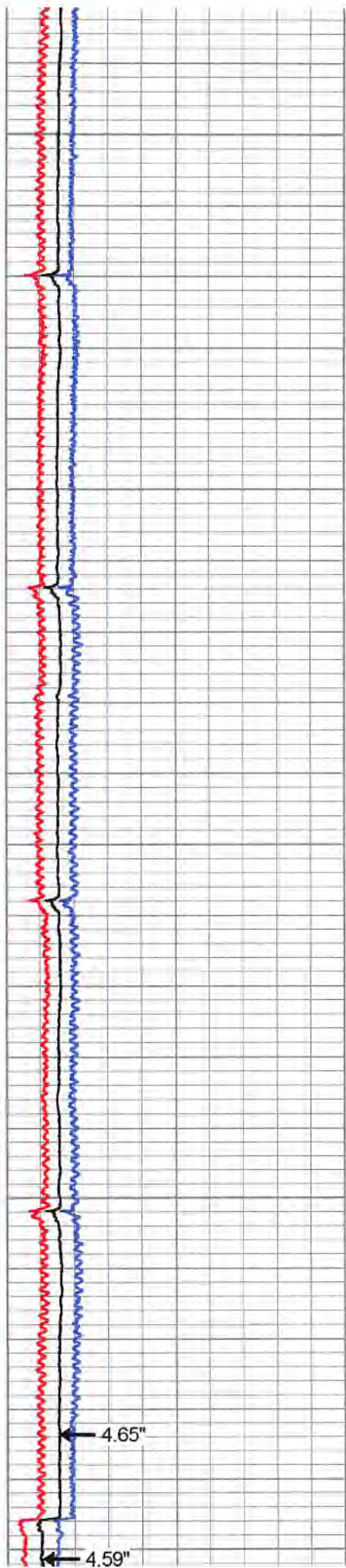


Database File 4-085-10252\_niley\_unit3h\_mac40\_01092017.db  
 Dataset Pathname MAC40/pass3  
 Presentation Format ptsmfc40  
 Dataset Creation Tue Jan 09 10:41:43 2018  
 Charted by Depth in Feet scaled 1:240

4.5	IDMX (in)	5.5	2.4375	R01 (in)	4.9375
4.5	IDMN (in)	5.5	1.875	R10 (in)	4.375
4.5	IDAV (in)	5.5	1.25	R20 (in)	3.75
0	LSPD (ft/min)	100	0.625	R30 (in)	3.125
0	DEVI (deg)	0.2	0	R40 (in)	2.5







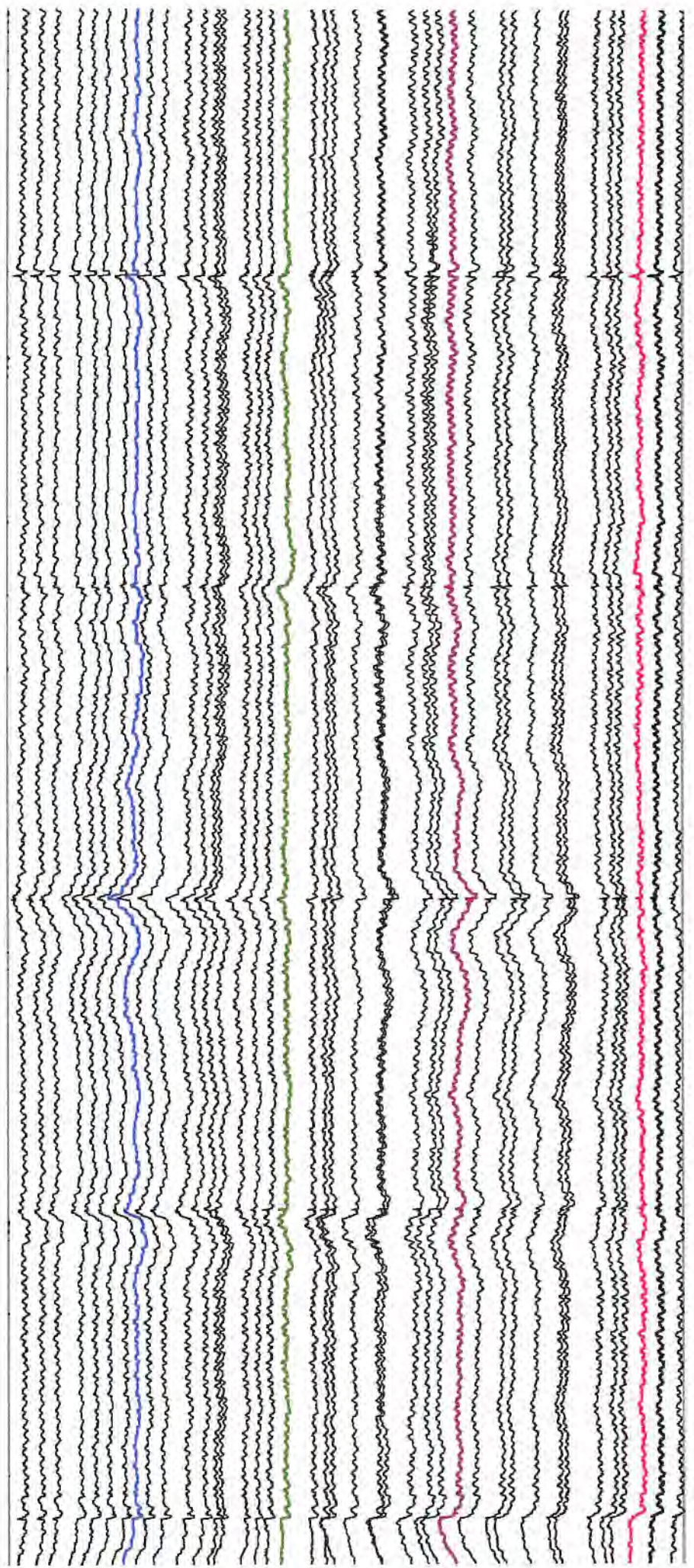
5150

5200

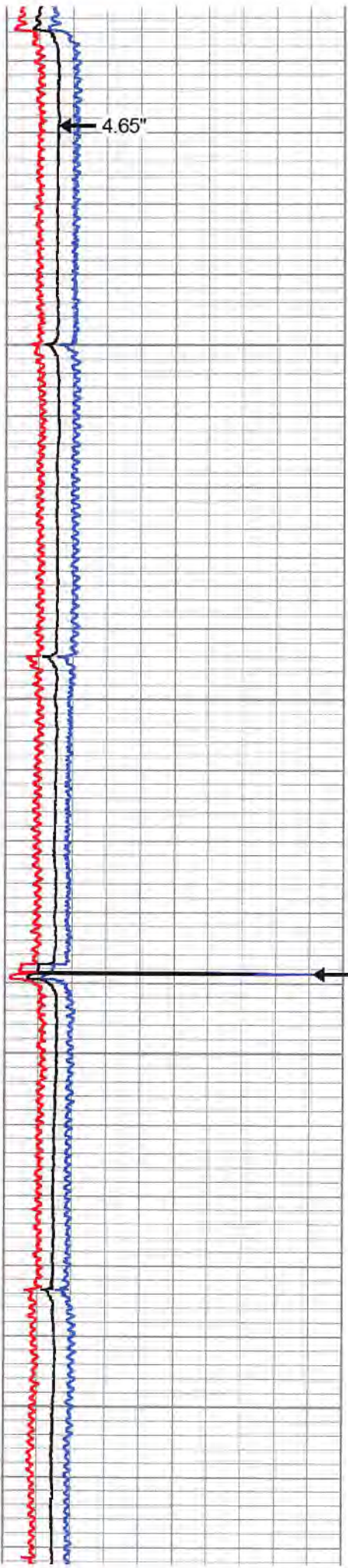
5250

5300

5350







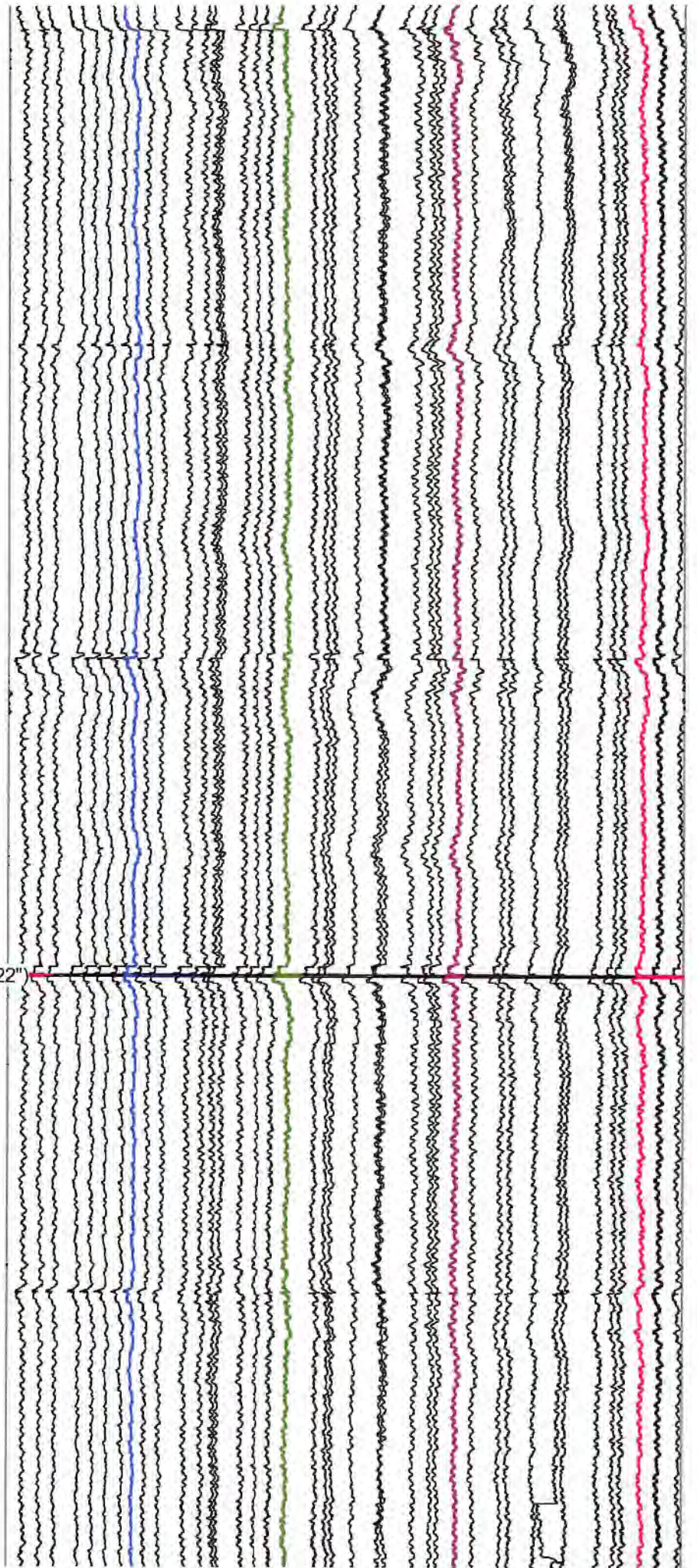
5400

5450

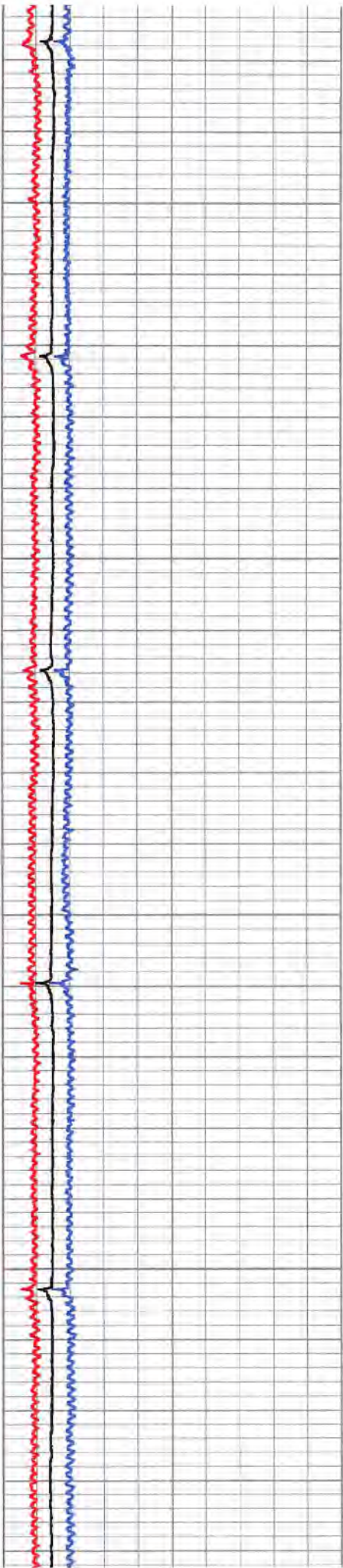
Airlock (5.22")

5500

5550





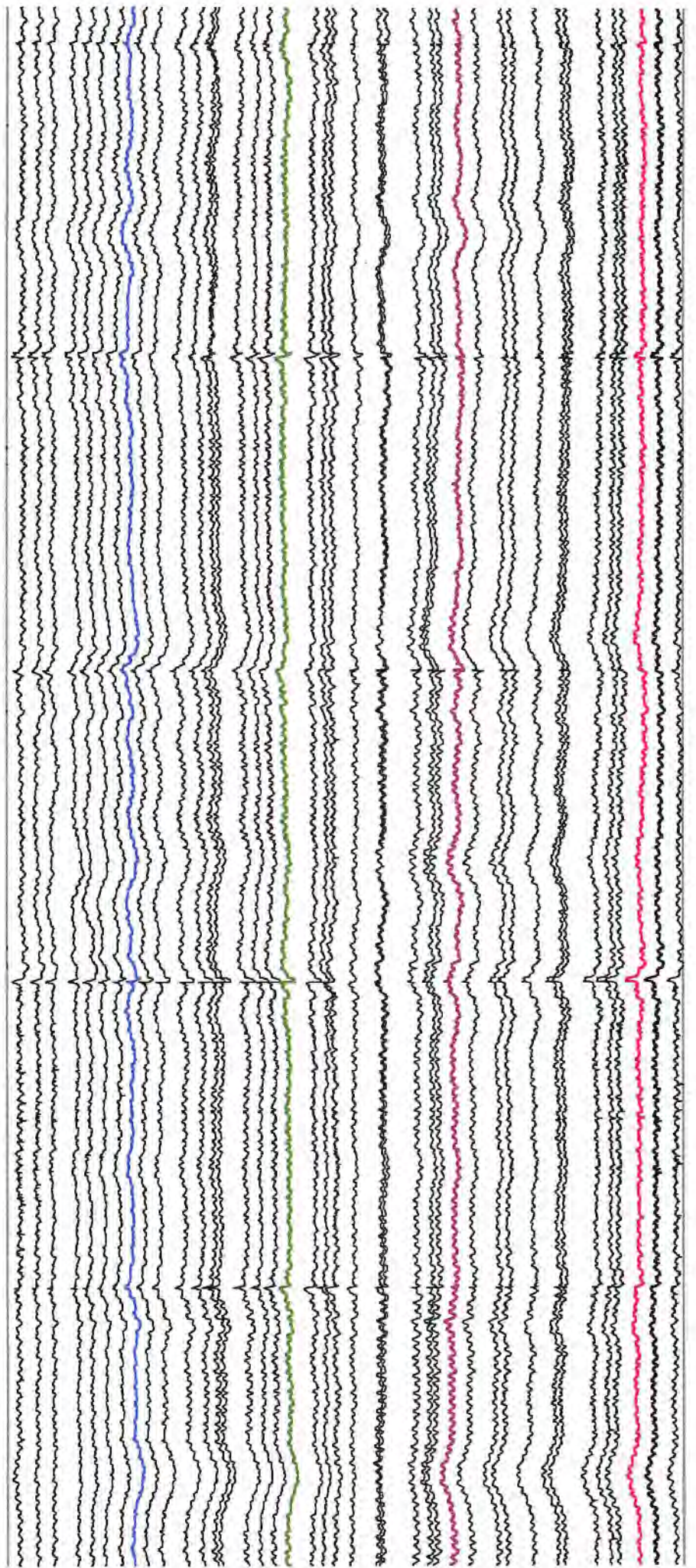


5600

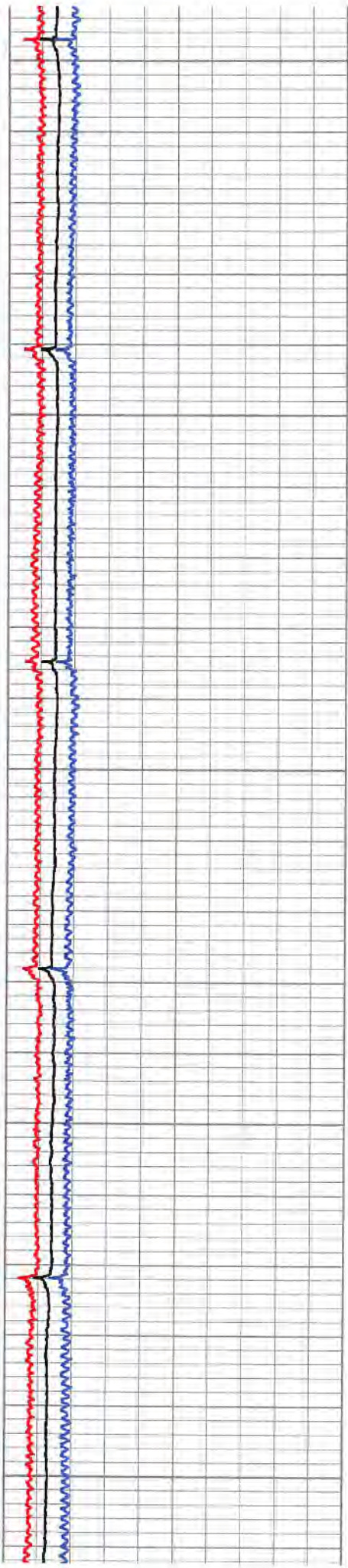
5650

5700

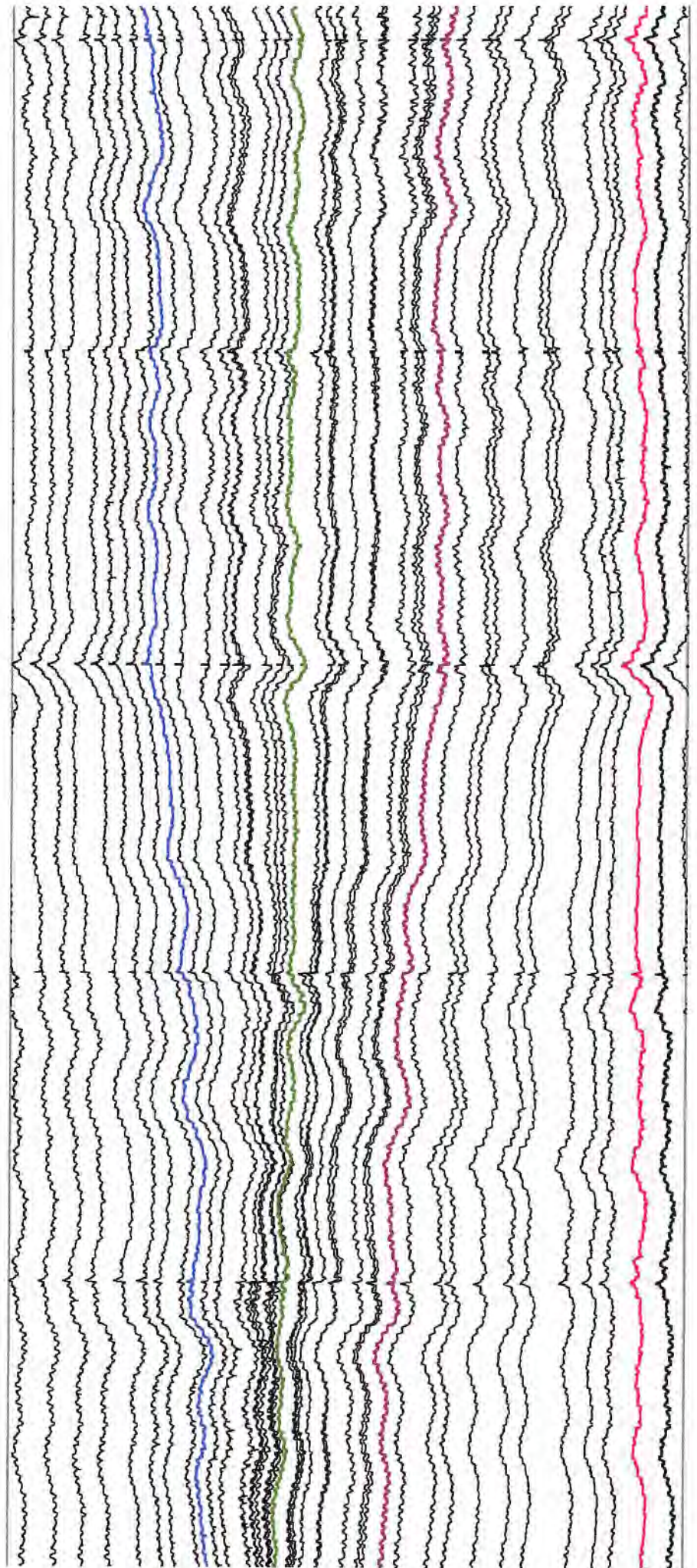
5750



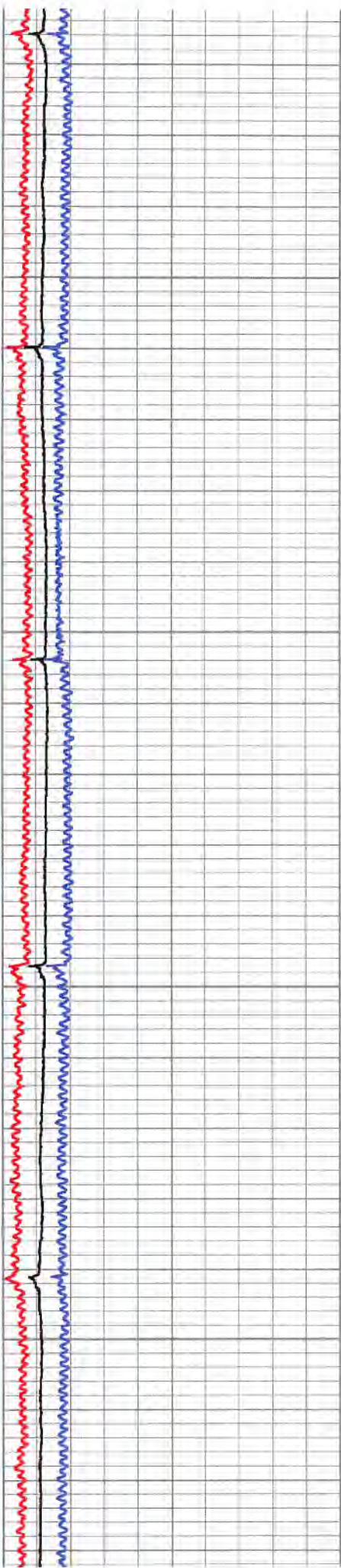




5800  
5850  
5900  
5950  
6000





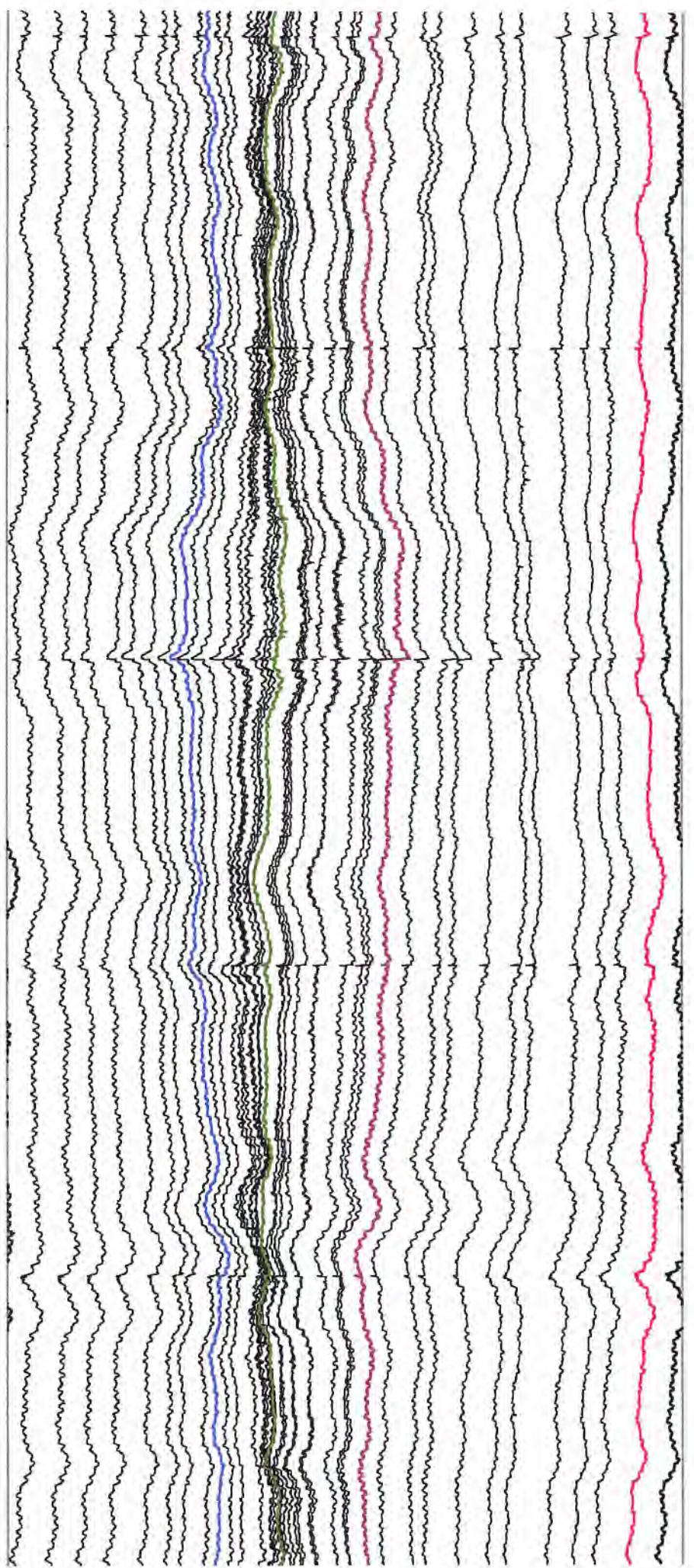


6050

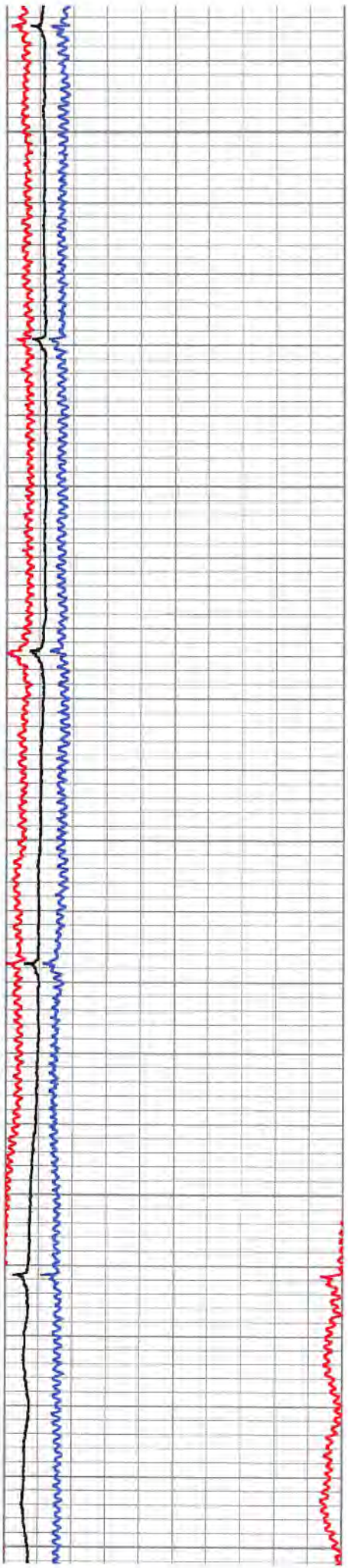
6100

6150

6200







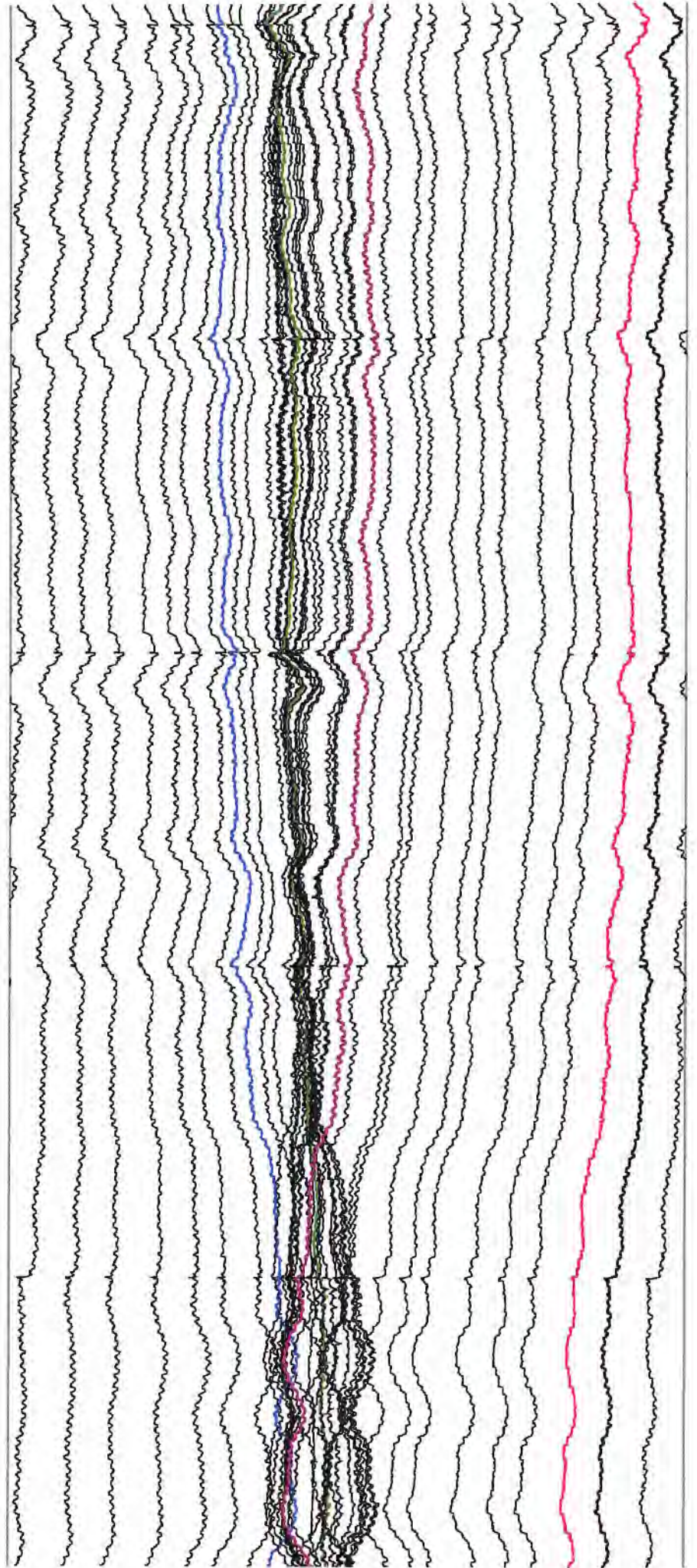
6250

6300

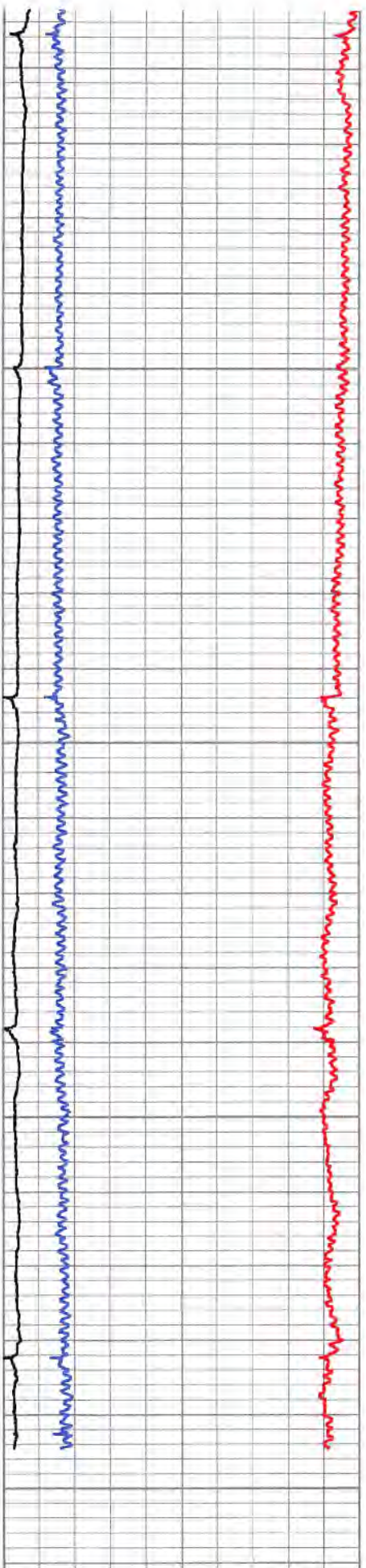
6350

6400

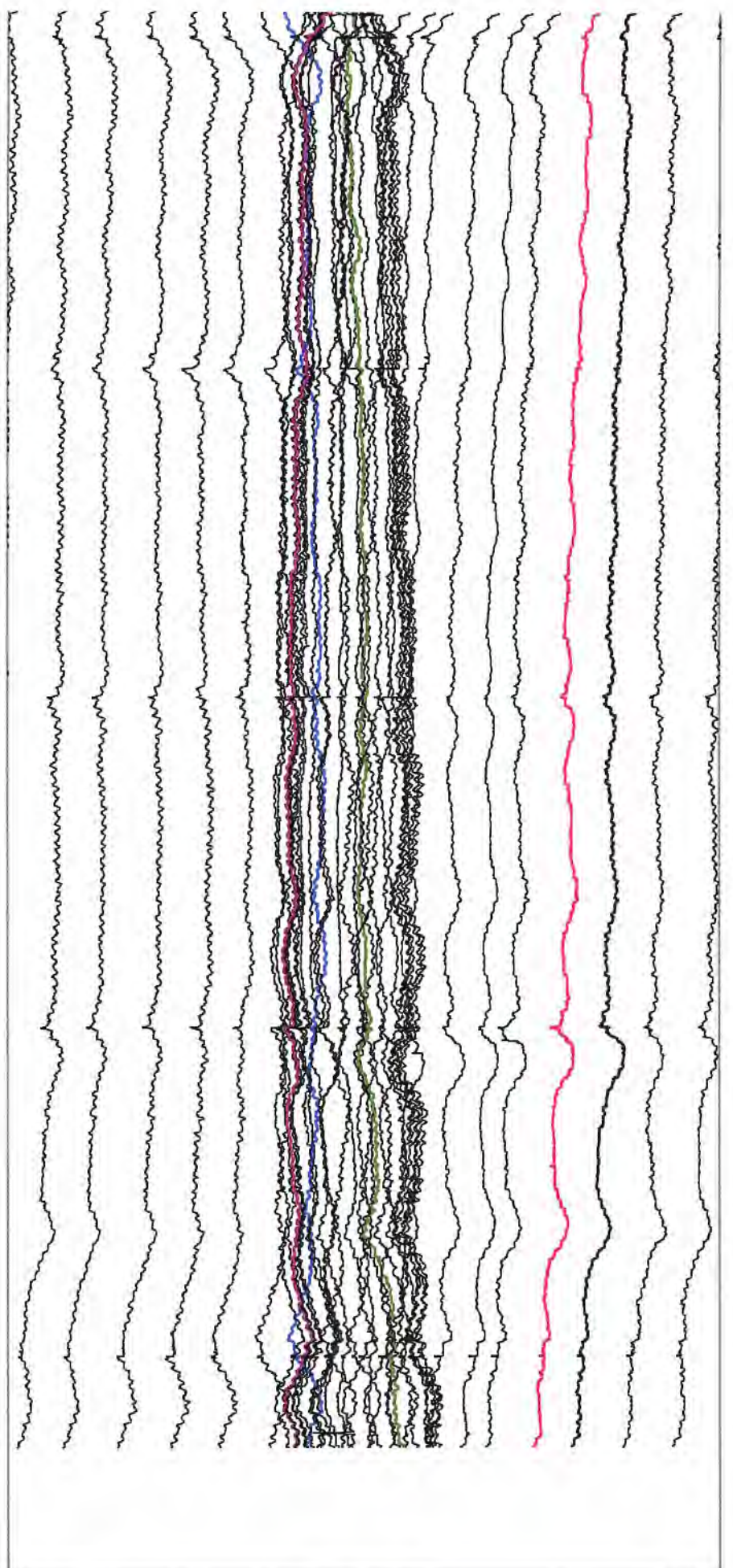
6450







6500  
6550  
6600  
6650



4.5	IDMX (in)	5.5
4.5	IDMN (in)	5.5

2.4375	R01 (in)	4.9375
1.875	R10 (in)	4.375



4.5	IDAV (in)	5.5
0	LSPD (ft/min)	100
0	DEVI (deg)	0.2

1.25	R20 (in)	3.75
0.625	R30 (in)	3.125
0	R40 (in)	2.5

## Log Variables

Database C:\ProgramData\Warrior\Data\4-085-10252\_niley\_unit3h\_mac40\_01092017.db  
 Dataset field/well/MAC40/pass1st/\_vars\_

### Top - Bottom

BHTEMP_Src	BOREID	BOTTEMP	CASEID	CASEOD	CASETHCK	CASEWGHT	MAXAMPL
TEMP	in	degF	in	in	in	lb/ft	mV
	7.875	121	4.67	5.5	0.415	23	72
MINAMPL	MinAPIWall	MINATTN	PERFS	PPT	SRFTEMP	TDEPTH	
mV	in	db/ft		usec	degF	ft	
1	0	0.8	0	260	1	6665	

### Variable Description

BHTEMP\_Src : BHTEMP Input Source Selector  
 BOREID : Borehole I.D.  
 BOTTEMP : Bottom Hole Temperature  
 CASEID : Casing I.D.  
 CASEOD : Casing O.D.  
 CASETHCK : Casing Thickness  
 CASEWGHT : Casing Weight  
 MAXAMPL : Maximum Amplitude

MINAMPL : Minimum Amplitude  
 MinAPIWall : Minimum API Wall Thickness  
 MINATTN : Minimum Attenuation  
 PERFS : Perforation Flag  
 PPT : Predicted Pipe Time  
 SRFTEMP : Surface Temperature  
 TDEPTH : Total Depth

### Calibration Report

Database File 4-085-10252\_niley\_unit3h\_mac40\_01092017.db  
 Dataset Pathname MAC40/pass1st  
 Dataset Creation Tue Jan 09 12:13:53 2018

### 40 Arm Multi Sensor Caliper Calibration Report

Serial Number:	FW-1408-123					
Tool Model:	ProbeMAC40					
Performed:	Tue Jan 09 07:49:04 2018					
Ref ID:	7.00	6.00	5.00	4.00	3.00	in
Arm1	9305.00	13943.00	18332.50	22380.00	25993.00	
Arm2	10700.00	15826.50	20538.50	24782.00	28498.00	
Arm3	5536.50	8333.00	11935.00	15788.50	19437.50	
Arm4	8607.00	13919.00	18803.50	23270.00	27117.50	
Arm5	4658.50	8231.50	12408.00	16849.50	21003.50	
Arm6	4680.50	7714.00	10978.00	14414.00	17827.00	
Arm7	4880.00	7699.00	11035.00	14677.00	18458.50	
Arm8	4840.00	9249.00	13884.50	18386.00	22267.00	
Arm9	4919.00	7785.50	10755.00	13888.00	17131.00	
Arm10	4973.00	8970.00	13217.00	17443.50	21227.00	
Arm11	4858.50	8521.00	12904.50	17332.50	21359.50	
Arm12	10115.00	15210.00	19910.50	24172.00	27754.00	
Arm13	4492.50	7426.00	10711.50	14257.50	17864.00	
Arm14	4421.00	7609.50	11065.00	14665.50	18183.00	
Arm15	6122.00	9509.00	12981.50	16438.00	19807.00	
Arm16	9007.50	14083.00	18751.50	22895.00	26453.00	
Arm17	4976.00	8468.50	12655.00	16954.00	20842.50	
Arm18	5261.00	9548.00	14111.00	18470.00	22542.50	
Arm19	7509.00	12345.00	16943.50	21137.50	24824.00	
Arm20	4342.50	7764.00	11862.00	15978.50	19788.50	
Arm21	4498.00	6973.00	9853.50	12887.50	16079.50	-
Arm22	10383.50	14767.00	18620.00	22262.00	25473.50	-



Arm23	10083.50	15041.50	19693.00	23875.00	27519.00	-
Arm24	4726.00	7928.50	11824.50	15983.00	20079.50	-
Arm25	4821.00	7413.00	10403.50	13525.00	16825.00	-
Arm26	6434.50	11565.00	16573.00	20979.00	24989.50	-
Arm27	4863.50	7716.00	11017.00	14414.50	17969.00	-
Arm28	4941.00	8035.50	11332.00	14710.00	18345.00	-
Arm29	9470.00	14356.00	19018.00	23240.50	27082.00	-
Arm30	8370.50	12958.00	17441.00	21379.50	25031.50	-
Arm31	9857.00	14690.50	19253.00	23323.50	27106.50	-
Arm32	4514.50	7486.50	10685.50	13901.00	17382.00	-
Arm33	8921.00	13939.00	18765.50	23065.50	26958.50	-
Arm34	4895.00	7898.00	10922.50	13881.00	17001.00	-
Arm35	4838.00	7625.00	10642.00	13743.50	17033.00	-
Arm36	5756.50	9600.50	13935.50	18049.50	21946.50	-
Arm37	6045.00	9037.50	12234.00	15656.00	19357.50	-
Arm38	4890.50	7753.00	10749.00	13836.00	17138.00	-
Arm39	9158.00	14148.00	18967.00	23399.50	27390.50	-
Arm40	7883.50	12964.00	17820.00	22205.00	26038.00	-

\* Bad

PROBE verifications Calibration Report

Performed:	Pre Verification	Post Verification	Casing Check	
Ref ID:	0.00	0.00	0.00	in
Min.	0.00	0.00	0.00	in
Max.	0.00	0.00	0.00	in
Avg.	0.00	0.00	0.00	in
Dia1	0.00	0.00	0.00	in
Dia2	0.00	0.00	0.00	in
Dia3	0.00	0.00	0.00	in
Dia4	0.00	0.00	0.00	in
Dia5	0.00	0.00	0.00	in
Dia6	0.00	0.00	0.00	in
Dia7	0.00	0.00	0.00	in
Dia8	0.00	0.00	0.00	in
Dia9	0.00	0.00	0.00	in
Dia10	0.00	0.00	0.00	in
Dia11	0.00	0.00	0.00	in
Dia12	0.00	0.00	0.00	in
Dia13	0.00	0.00	0.00	in
Dia14	0.00	0.00	0.00	in
Dia15	0.00	0.00	0.00	in
Dia16	0.00	0.00	0.00	in
Dia17	0.00	0.00	0.00	in
Dia18	0.00	0.00	0.00	in
Dia19	0.00	0.00	0.00	in
Dia20	0.00	0.00	0.00	in


Inclinometer Calibration Report

Performed:	Tue Jan 09 08:05:15 2018				
	Low Read.	High Read.	Low Ref.	High Ref.	
X Accelerometer	-3620.00	3604.00	-1.00	1.00	gee
Y Accelerometer	-3722.00	3466.00	-1.00	1.00	gee
Z Accelerometer	60.13	3615.38	0.00	1.00	gee



### Gamma Ray Calibration Report

Serial Number:	275	
Tool Model:	Probe	
Performed:	Thu May 09 12:03:43 2013	
Calibrator Value:	1.0	GAPI
Background Reading:	0.0	cps
Calibrator Reading:	1.0	cps
Sensitivity:	1.0000	GAPI/cps

Sensor	Offset (ft)	Schematic	Description	Length (ft)	O.D. (in)	Weight (lb)	
			CHD-STNDRD (GOI) Standard Cable Head	1.00	1.69	10.00	
			CENT-Probe275 Probe 2.75" 4 Arm Bow Spring Centralizer	2.88	1.69	36.00	
CCL	30.01						
			GR-Probe (275) Probe 2.75" 4 Channel Pulse	4.92	2.75	55.00	
GR	27.27						
			Adaptor-6-1 6 to 1 adaptor	0.28	2.75	2.00	
			CENT-Probe275 Probe 2.75" 4 Arm Bow Spring Centralizer	2.88	1.69	36.00	
ACCZ	21.30						
ACCY	21.30						
ACCX	21.30						
ETEMP	19.63		MAC40-ProbeMAC40 (FW-1408-123) 40 arm Caliper	6.91	2.75	71.00	
Meas	17.34						
			Knuckle-1.55 GO style	0.71	1.55	2.00	
			Knuckle-1.55 GO style	0.71	1.55	2.00	
			CENT-Probe275 Probe 2.75" 4 Arm Bow Spring Centralizer	2.88	1.69	36.00	
			Sinker-1.5 5' Sinker	5.00	1.50	20.00	



Sinker-1.7"  
7' Sinker

7.00

1.70

30.00

Dataset: 4-085-10252\_niley\_unit3h\_mac40\_01092017.db: field/well/MAC40/pass1st  
Total length: 35.17 ft  
Total weight: 300.00 lb  
O.D.: 2.75 in

**ALLIED**  
**HORIZONTAL**  
WIRELINE SERVICES

Company Antero Resources Corporation

Well Niley Unit 1H

Field Mountain

County Ritchie

State West Virginia

Country USA