



QES DIRECTIONAL DRILLING

FEDERAL 20-3  
 Scale 2":100' - TVD  
 11/21/2017 8:22 AM

Oper. Company: CPC MINERALS, LLC  
 Well: FEDERAL 20-3  
 Field: IADHO OVERTHRUST  
 Rig: CAPSTAR 330  
 Well ID: 11-019-200014  
 Job Number: RM 171226

State: IDAHO  
 County: BONNEVILLE  
 Country: USA  
 Location: SEC 20, T3S, R43E  
 Start Date: 11/16/2015 13:00:00  
 End Date: 11/21/2017 07:00:00

Latitude: 43.134  
 Longitude: -111.43395

Elev GL: 6394  
 Elev DF: 6408  
 Elev KB: 6408

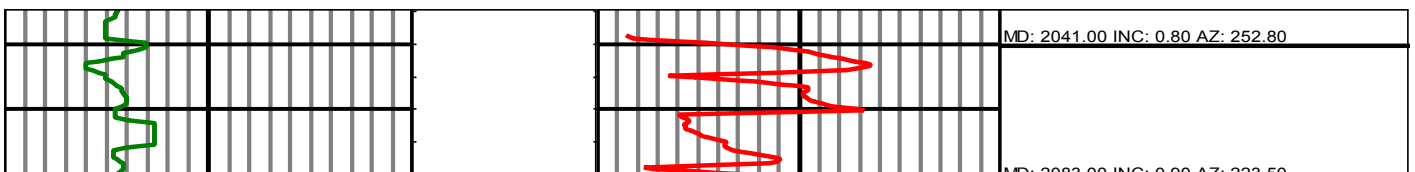
Operator 1: J RODRIGUEZ

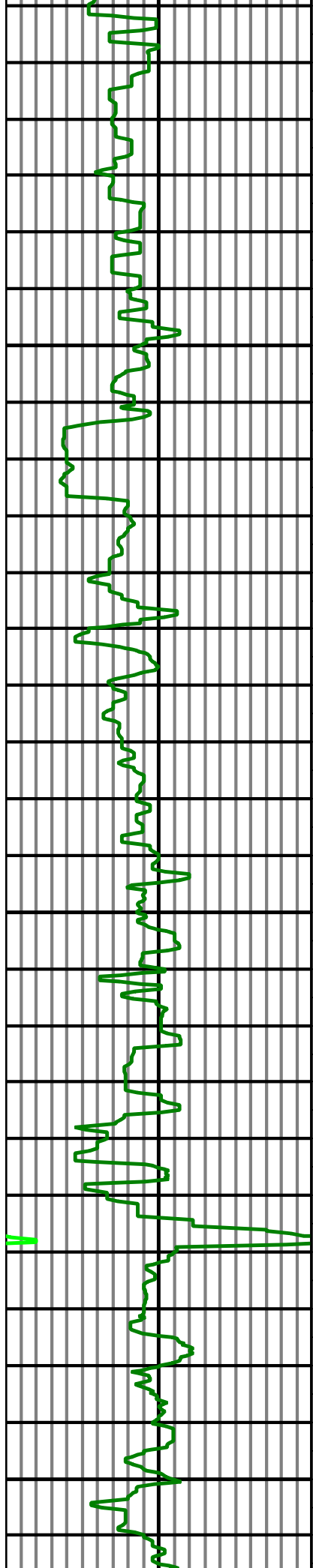
Operator 2: G HARRIS

Tool Run Data	Run #1	Run #2	Run #3	Run #4	Run #5
Tool S/N	775	775			
Bit Size	8.75	8.75			
Cal Factor	3.5	3.5			
Survey Offset	49.00	52.00			
Gamma Offset	38.00	41.00			
Resistivity Offset	0.00	0.00			
Start Depth	2030.00	4921.00			
StartDate	11/16/2017	11/19/2017			
StartTime	13:00	00:30			
EndDepth	4921.00	7035.00			
EndDate	11/18/2017	11/21/2017			
EndTime	21:30	07:00			
Mud Type	WBM	WBM			
Mud Weight	8.3	9.1			
Funnel Viscosity	28	39			
Plastic Viscosity	2	8			
Yield Point	2	11			
Gel Strength	1	6			
Solids Content	.8	1.6			
Sand Content	TR	TR			
Mud Alkalinity	.55	.23			
Filtrate Alkalinity	.38	.11			
Chlorides	400	2000			
Temperature	138	190			

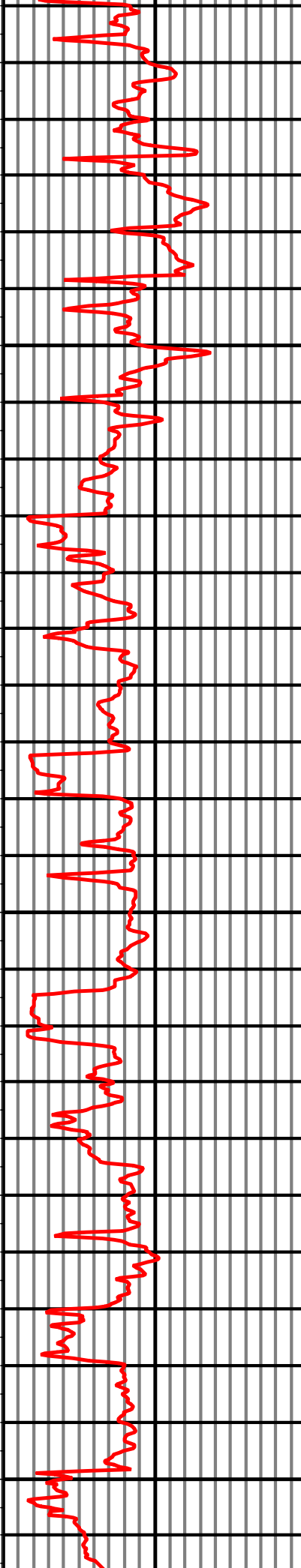
Hole Data			Casing Data		
Size	From	To	Size	From	To
8.75	2030.00	7035.00	9.625	0.00	2022.00

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, cost damages or expenses incurred or sustained by anyone resulting from an interpretation made by any of our officers, agents, or employees.

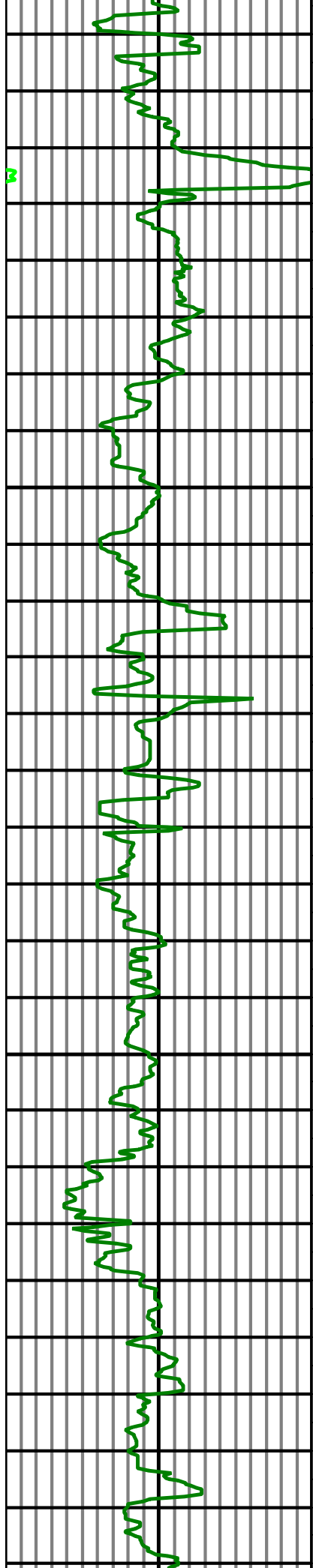




2,100  
2,200  
2,300  
2,400  
2,500  
2,600



MD: 2083.00 INC: 0.90 AZ: 223.50
MD: 2126.00 INC: 0.80 AZ: 222.10
MD: 2168.00 INC: 0.70 AZ: 199.20
MD: 2210.00 INC: 1.30 AZ: 177.40
MD: 2252.00 INC: 1.50 AZ: 173.20
MD: 2294.00 INC: 1.60 AZ: 169.00
MD: 2379.00 INC: 1.00 AZ: 159.50
MD: 2463.00 INC: 0.30 AZ: 163.20
MD: 2548.00 INC: 0.30 AZ: 192.70
MD: 2636.00 INC: 0.70 AZ: 189.50



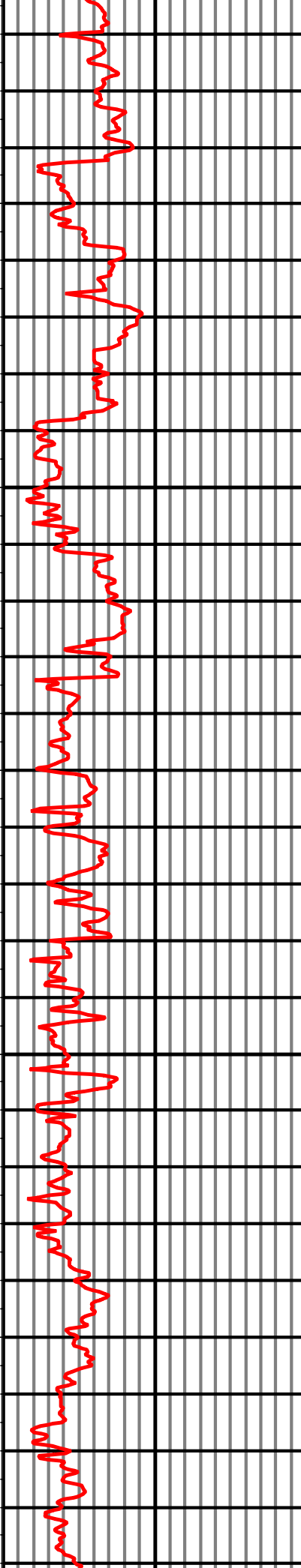
2,700

2,800

2,900

3,000

3,100



MD: 2636.00 INC: 0.70 AZ: 189.50

MD: 2727.00 INC: 1.10 AZ: 200.30

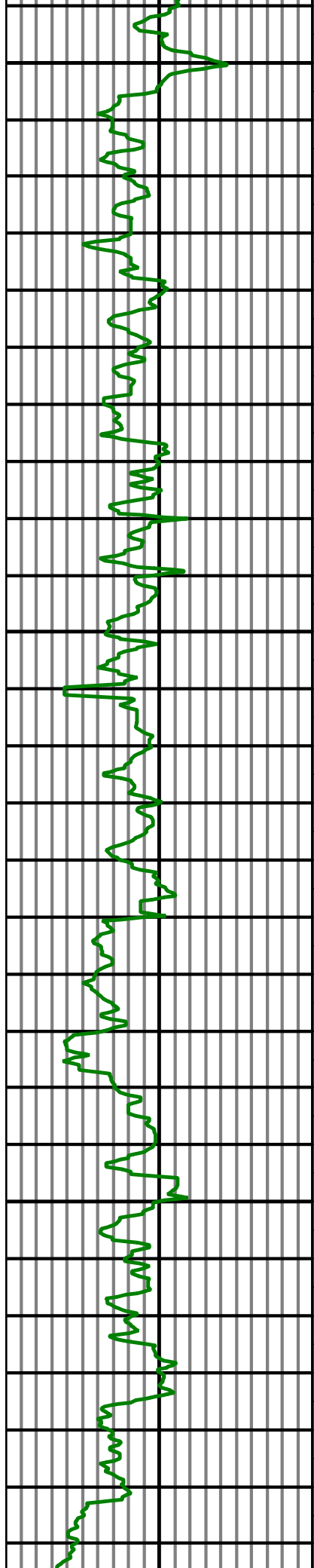
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MD: 2909.00 INC: 0.90 AZ: 214.00

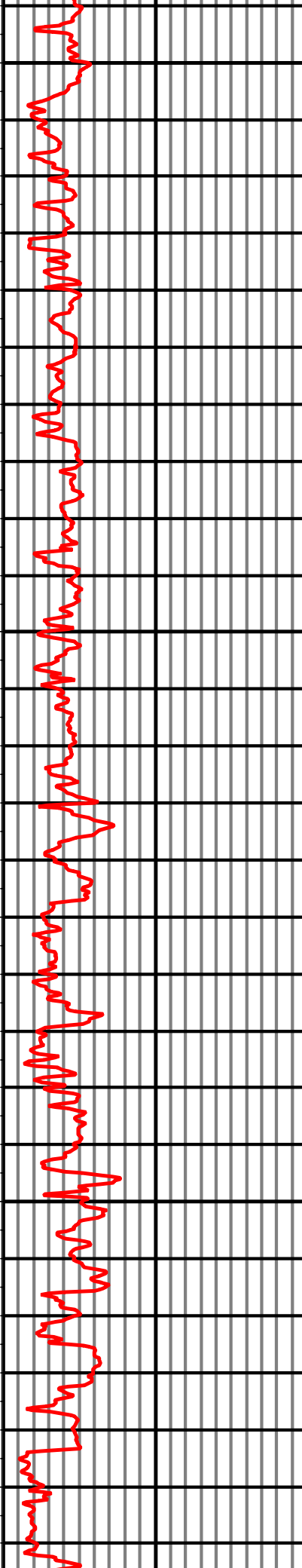
MD: 3001.00 INC: 1.10 AZ: 207.10

MD: 3092.00 INC: 0.60 AZ: 216.60

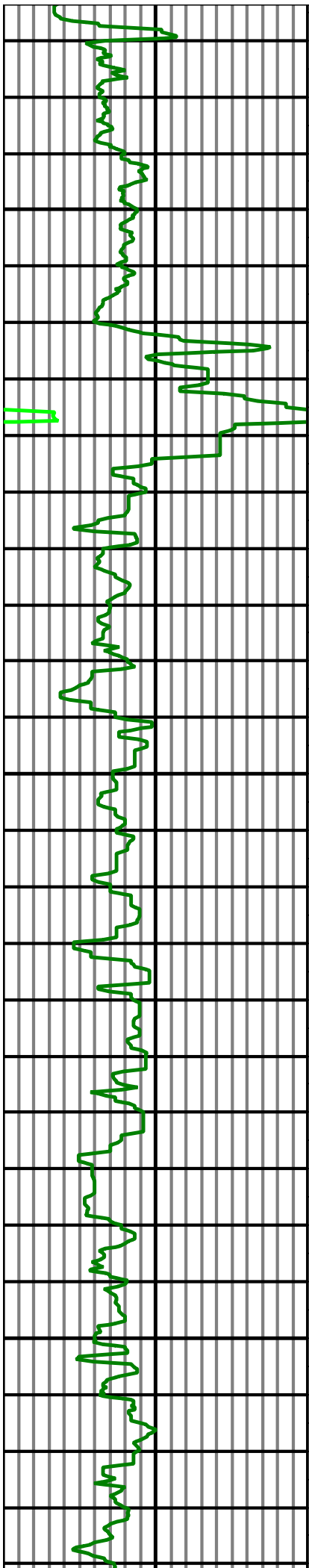
MD: 3183.00 INC: 0.30 AZ: 317.10



3,200  
3,300  
3,400  
3,500  
3,600  
3,700



MD: 3183.00 INC: 0.30 AZ: 317.10
MD: 3229.00 INC: 1.10 AZ: 354.80
MD: 3274.00 INC: 1.50 AZ: 9.50
MD: 3320.00 INC: 2.00 AZ: 10.90
MD: 3366.00 INC: 2.30 AZ: 11.10
MD: 3412.00 INC: 3.00 AZ: 18.50
MD: 3457.00 INC: 3.60 AZ: 25.40
MD: 3503.00 INC: 4.80 AZ: 25.40
MD: 3548.00 INC: 6.30 AZ: 23.80
MD: 3594.00 INC: 7.70 AZ: 26.80
MD: 3640.00 INC: 8.70 AZ: 27.30
MD: 3685.00 INC: 9.30 AZ: 24.50
MD: 3731.00 INC: 10.30 AZ: 19.70



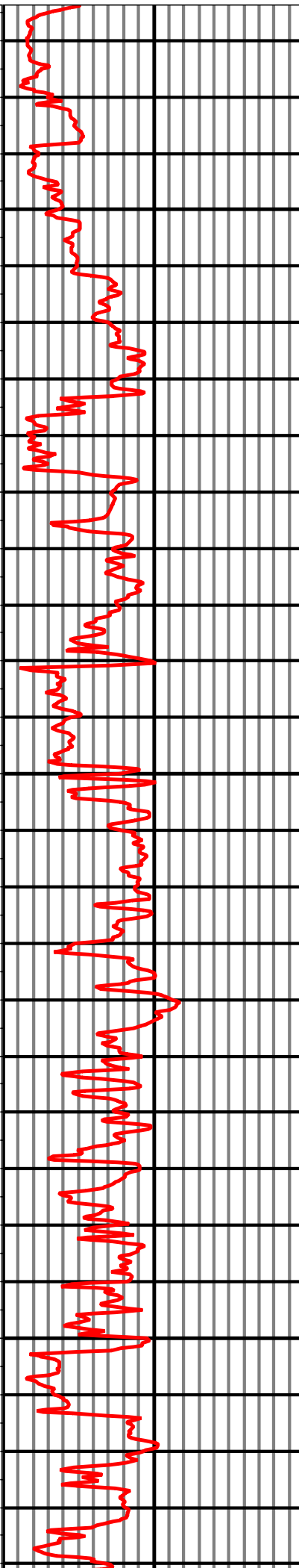
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3,900

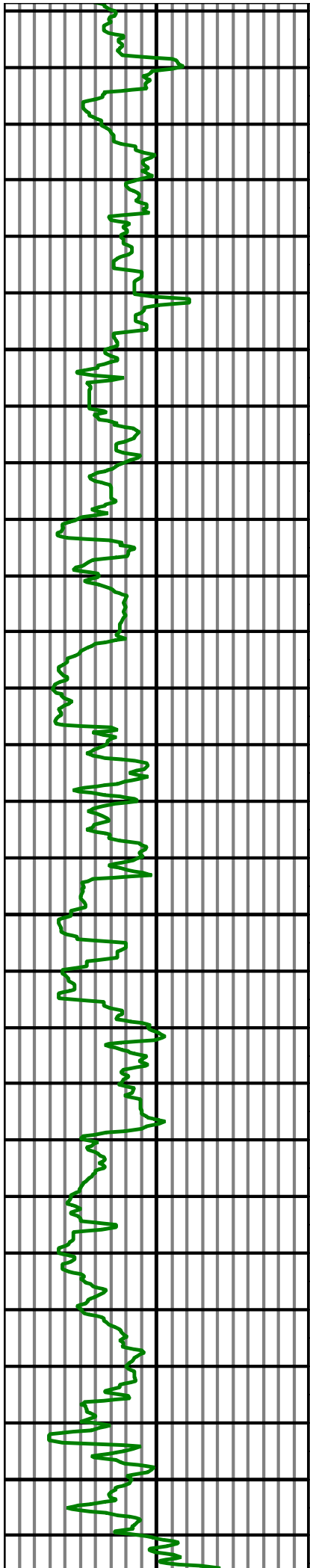
4,000

4,100

4,200



MD: 3777.00 INC: 10.60 AZ: 14.80
MD: 3822.00 INC: 11.30 AZ: 13.60
MD: 3868.00 INC: 12.10 AZ: 12.70
MD: 3914.00 INC: 11.80 AZ: 9.70
MD: 3959.00 INC: 11.30 AZ: 9.20
MD: 4005.00 INC: 10.10 AZ: 6.70
MD: 4050.00 INC: 10.00 AZ: 6.40
MD: 4096.00 INC: 9.80 AZ: 5.00
MD: 4141.00 INC: 9.40 AZ: 5.10
MD: 4187.00 INC: 9.80 AZ: 6.50
MD: 4233.00 INC: 10.00 AZ: 9.50
MD: 4279.00 INC: 10.60 AZ: 11.50



4,300

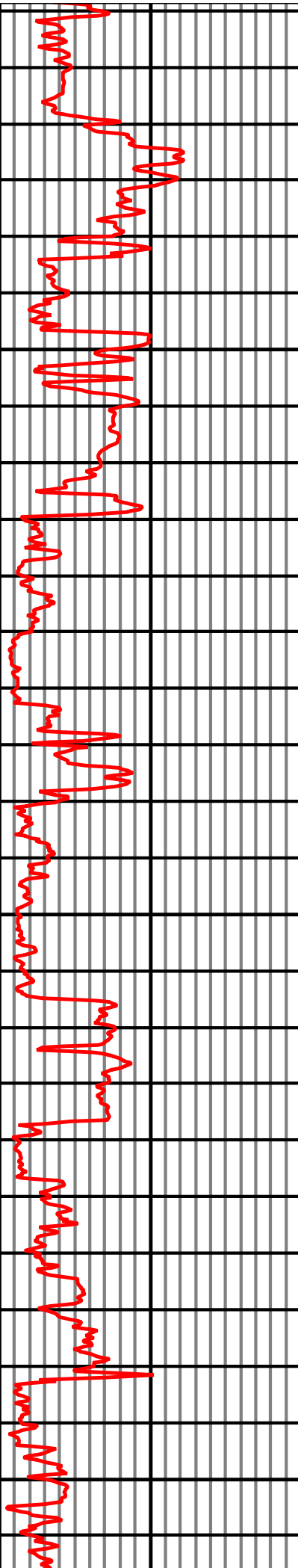
4,400

4,500

4,600

4,700

4,800



MD: 4324.00 INC: 10.90 AZ: 13.10

MD: 4370.00 INC: 11.60 AZ: 13.80

MD: 4415.00 INC: 11.30 AZ: 13.90

MD: 4461.00 INC: 11.80 AZ: 14.60

MD: 4506.00 INC: 11.10 AZ: 14.60

MD: 4552.00 INC: 10.60 AZ: 14.60

MD: 4598.00 INC: 9.90 AZ: 15.30

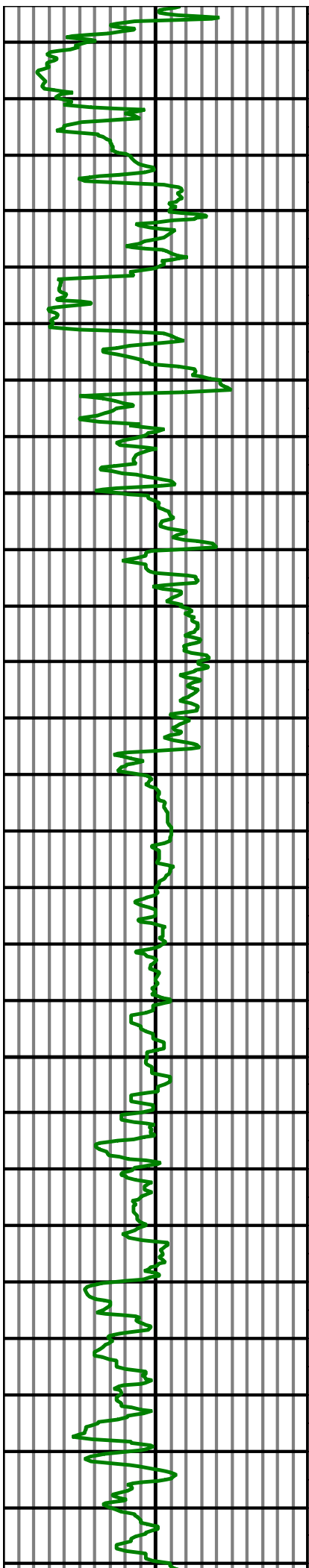
MD: 4643.00 INC: 9.20 AZ: 13.80

MD: 4689.00 INC: 9.10 AZ: 12.90

MD: 4735.00 INC: 8.90 AZ: 12.30

MD: 4780.00 INC: 9.40 AZ: 13.60

MD: 4826.00 INC: 9.60 AZ: 16.40



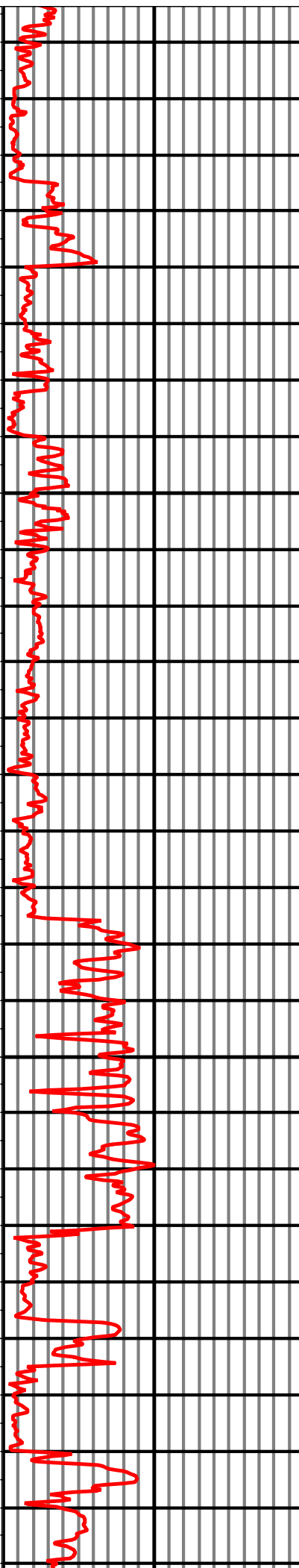
4,900

5,000

5,100

5,200

5,300



MD: 4872.00 INC: 8.90 AZ: 21.10

MD: 4918.00 INC: 9.10 AZ: 24.10

MD: 4963.00 INC: 8.60 AZ: 23.60

MD: 5009.00 INC: 9.00 AZ: 21.10

MD: 5054.00 INC: 9.30 AZ: 20.30

MD: 5100.00 INC: 9.50 AZ: 14.80

MD: 5146.00 INC: 9.10 AZ: 11.80

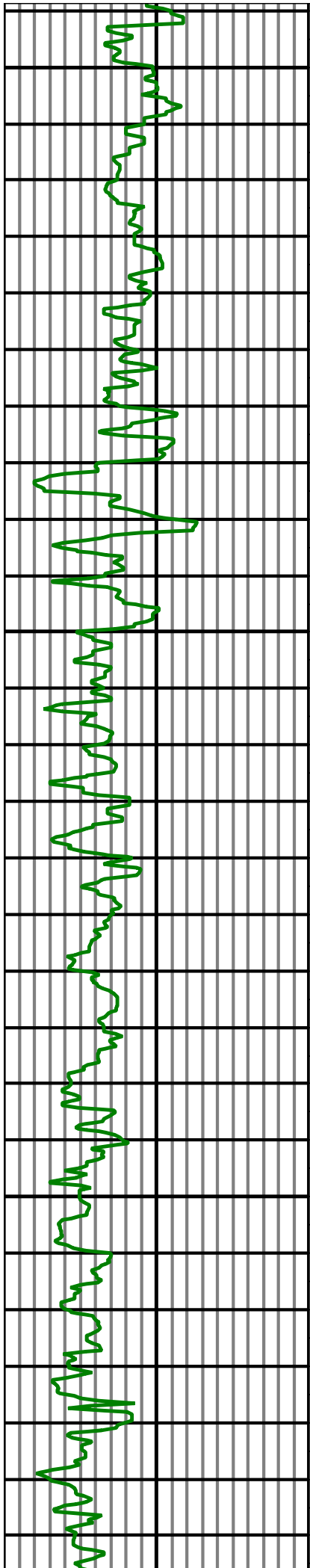
MD: 5191.00 INC: 7.90 AZ: 16.60

MD: 5237.00 INC: 6.90 AZ: 18.10

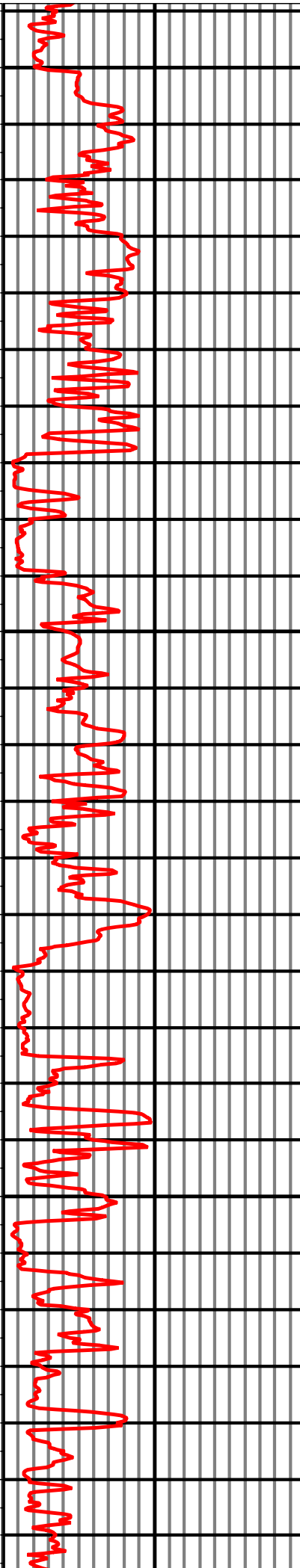
MD: 5283.00 INC: 6.20 AZ: 20.30

MD: 5328.00 INC: 5.80 AZ: 11.30

MD: 5374.00 INC: 6.00 AZ: 357.90



5,400  
5,500  
5,600  
5,700  
5,800  
5,900



MD: 5420.00 INC: 5.70 AZ: 358.60

MD: 5465.00 INC: 5.40 AZ: 359.70

MD: 5511.00 INC: 4.80 AZ: 356.70

MD: 5557.00 INC: 4.70 AZ: 357.20

MD: 5602.00 INC: 6.70 AZ: 7.80

MD: 5648.00 INC: 7.60 AZ: 10.20

MD: 5694.00 INC: 7.90 AZ: 10.40

MD: 5740.00 INC: 8.00 AZ: 8.10

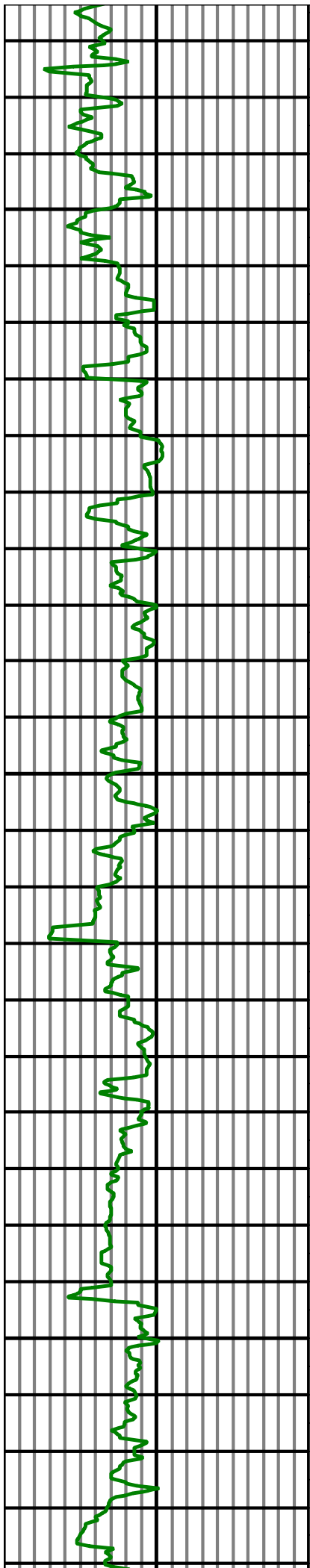
MD: 5785.00 INC: 6.90 AZ: 6.50

MD: 5831.00 INC: 6.40 AZ: 6.20

MD: 5876.00 INC: 5.80 AZ: 8.10

MD: 5922.00 INC: 5.90 AZ: 5.50





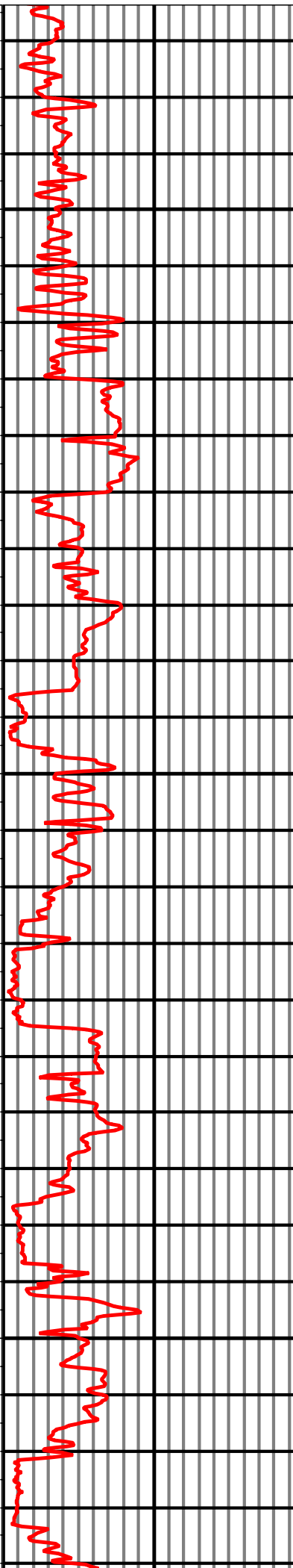
6,000

6,100

6,200

6,300

6,400



MD: 5968.00 INC: 6.30 AZ: 5.10

MD: 6013.00 INC: 6.70 AZ: 5.10

MD: 6059.00 INC: 7.00 AZ: 6.00

MD: 6105.00 INC: 7.60 AZ: 6.90

MD: 6150.00 INC: 8.40 AZ: 9.20

MD: 6196.00 INC: 8.80 AZ: 11.80

MD: 6242.00 INC: 8.40 AZ: 14.30

MD: 6287.00 INC: 8.40 AZ: 15.00

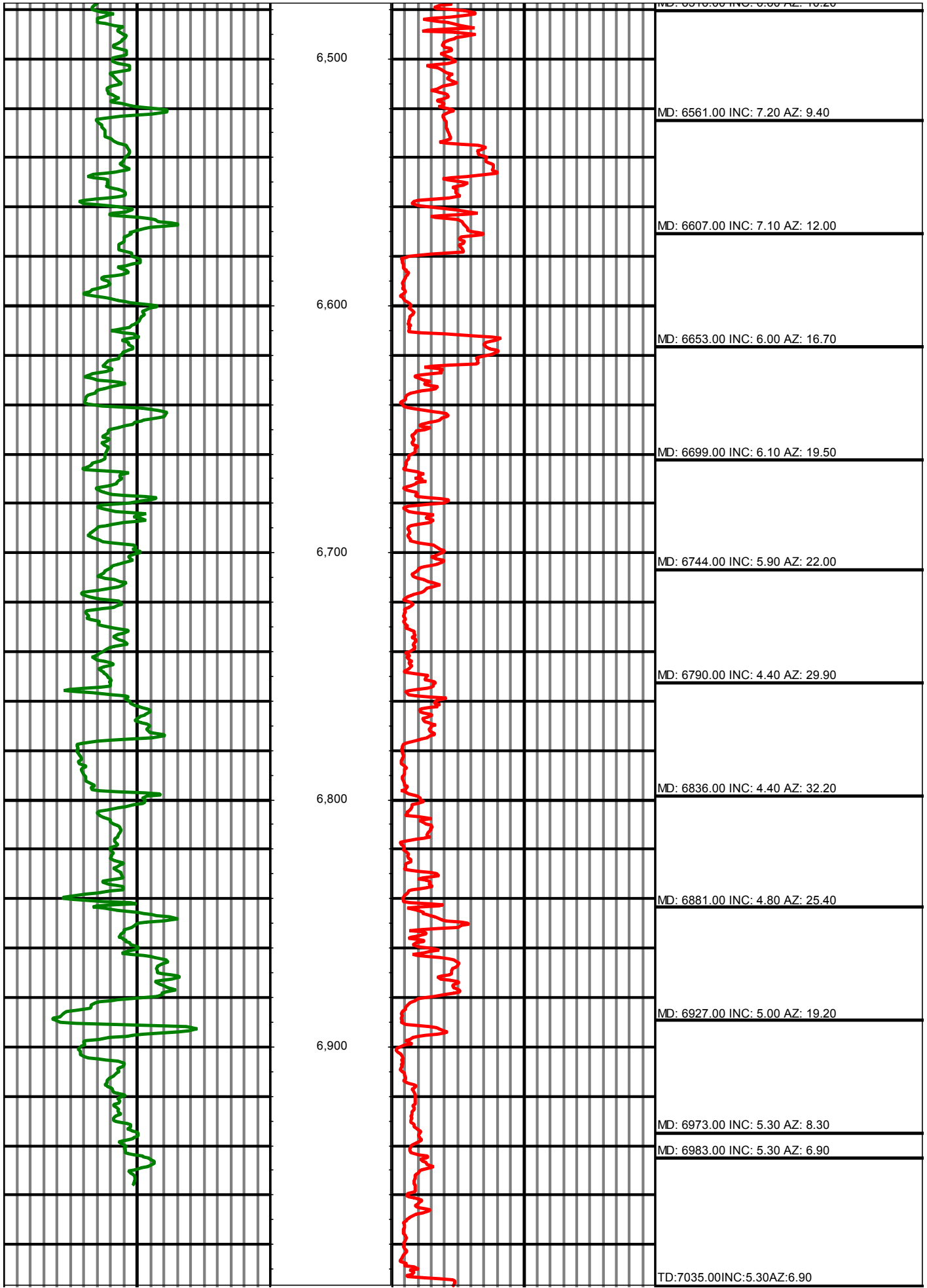
MD: 6333.00 INC: 7.20 AZ: 17.40

MD: 6379.00 INC: 7.50 AZ: 17.40

MD: 6424.00 INC: 7.60 AZ: 12.70

MD: 6470.00 INC: 7.70 AZ: 12.00

MD: 6516.00 INC: 6.60 AZ: 10.20



0.00 GR(API) 150.00 TVD 0.00 ROP(FT/HR) 500.00 Surveys (MD/INC/AZ)  
 150.00 300.00 FT 500.00 1,000.00