

BAKER HUGHES				MEMORY LOG							
Scale: 1:240 TVD Depth Reference: Driller's Depth				Company: Noble Energy							
				Well: ANNI LD29-755							
				Field: Weld County							
				County: Weld County				State: Colorado			
				Status: Final Print							
API No: 05-123-43288-00		Job ID: 8173263		Surface Location: Latitude: 040° 43' 49.116" N Longitude: 103° 53' 33.180" W		Other Services: Directional					
Permanent Datum (P.D.): Mean Sea Level		SEC: 20		TMN: 9N		RGE: 58W		Elevation: 0.00 ft		KB: N/A	
Log Measured From: Rig Floor		Above P.D.		4897.00 ft		GL:		4897.00 ft		4867.00 ft	
Dates				Interval Logged				Magnetic Field Reference			
Date From: 2016-10-22		Top: (ft) 1913.00		Azi Reference North:		Grid		Dip Angle: (deg) 67.21			
Date To: 2016-10-23		Bottom: (ft) 5938.00		Total Magnetic Field Strength: (nT)		52624					
Spud Date: 2016-10-21				Mag to Reference North Correction: (deg)		6.64 E					
Borehole Record				Casing Record							
Hole Size (in)		From (ft)		To (ft)		Size (in)		Weight (lb/ft)		From (ft)	
13.500		0.00		1925.00		9.625		36.00		0.00	
8.500		1925.00		11146.00						1915.00	
Mud Record				Deviation Record							
Type		From (ft)		To (ft)		Hole Size (in)		Interval (ft)		Inc Az (Start)	
Oil Based Mud		1925.00		11146.00		8.500		9221.00		0.37 193.73	
										90.28 176.97	
										I	
										I	
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										I	
Acquisition System				Software Version				Other			
Baker Hughes Cadence		G3.3		Rig: H&P 517		Contractor: Helmerich & Payne Drilling Co		District: RMD		Unit: D&E	
PlotStudio		3.3.7410.1									

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Log Run Summary

Run No	Bit Run No.	Bit Size (in)	Bit Type	Bit Gauge Length (in)	Assembly Type	Logged Interval		Bit Depth Interval		Date / Time		Circ. Hours (h)
						Top (ft)	Bottom (ft)	From (ft)	To (ft)	Start Logging	End Logging	
1	1	8.500	PDC	2.00	AutoTrak Curve	1913.00	11133.00	1925.00	11146.00	2016-10-22 09:43	2016-10-24 06:41	42.09

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Alex Osborne	2016-10-21	2016-10-25	Scott Sims	2016-10-21	2016-10-25			

Mud Properties Record

Date / Time	Run No.	Measured Depth (ft)	Mud Type	Density (ppg)	Viscosity (cP)	pH	Fluid Loss (cm3)	Oil / Water	Source	Total Chlorides (ppm)	K+ (%)
2016-10-22 08:00	1	1925.00	Oil Based Mud	9.4	56	N/A	20.4	72/18	Active Pit	22500	0.00
2016-10-22 20:00	1	4009.00	Oil Based Mud	9.2	43	N/A	18.4	73/17	Active Pit	24000	0.00
2016-10-23 08:00	1	6415.00	Oil Based Mud	9.1	42	N/A	20.0	73/27	Active Pit	25000	0.00
2016-10-23 20:00	1	9095.00	Oil Based Mud	9.2	41	N/A	17.6	75/15	Active Pit	22500	0.00
2016-10-24 08:00	1	11146.00	Oil Based Mud	9.3	41	N/A	21.6	75/15	Active Pit	22500	0.00

Equipment and Service Data

Run No.	Tool	Serial Number	Measurement	Sensor Offset (ft)	Bit Offset (ft)	Max O.D. (in)	Min I.D. (in)
1	ATC_SU	12575814	Near Bit Inclination	5.93	6.73	7.000	4.330
1	ATC_SU	12575814	Near Bit VSS	5.93	6.73	7.000	4.330
1	ATC_MWD	12127451	Gamma (single)	2.20	12.35	7.000	3.250
1	ATC_MWD	12127451	Directional (mag)	12.27	22.42	7.000	3.250

Service and Tool Mnemonics

Mnemonic	Name	Description
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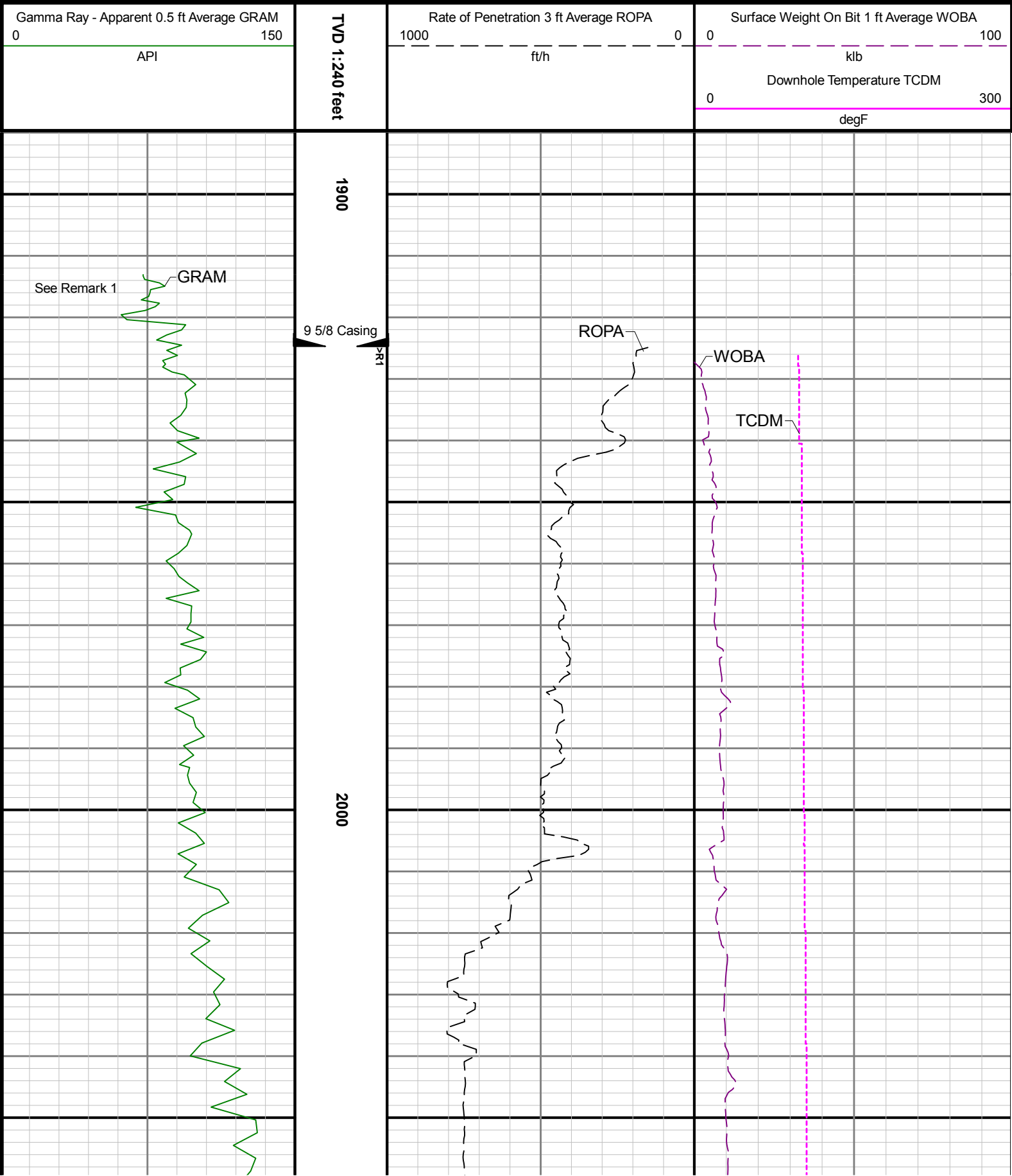
ATC_SU	ATC_SU	Auto Trak Curve Steering Unit
ATC_MWD	ATC_MWD	Auto Trak Curve MWD
ATC_LCPM	ATC_LCPM	Auto Trak Curve LCPM

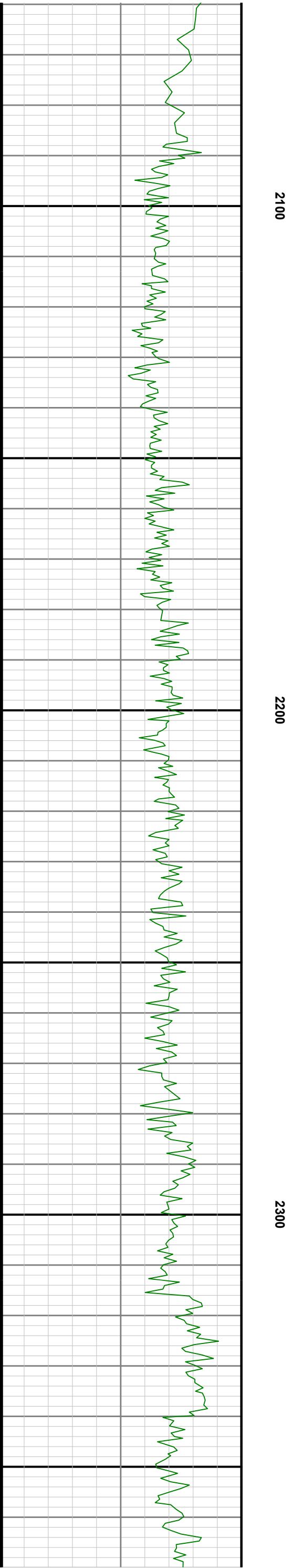
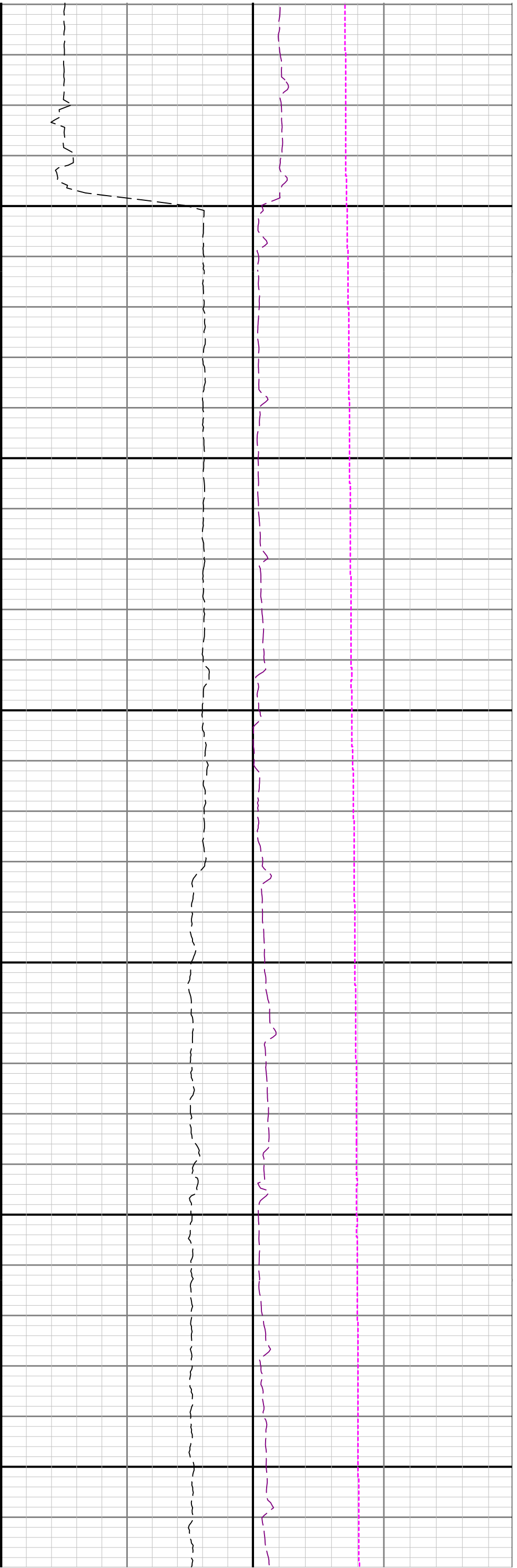
Comments	
1	Depth measurements obtained from a depth control system not supplied or operated by Baker Hughes. Due to lack of control by Baker Hughes logging engineers, depth calibrations and measurements could not be independently verified.
2	Baker Hughes LWD Run 1 utilized 6 3/4 inch NaviGamma Services (Gamma Ray and Directional) behind an 8 1/2 inch bit and rotary steerable assembly from 1925 to 11146 ft MD (1925 to 5913 ft TVD).

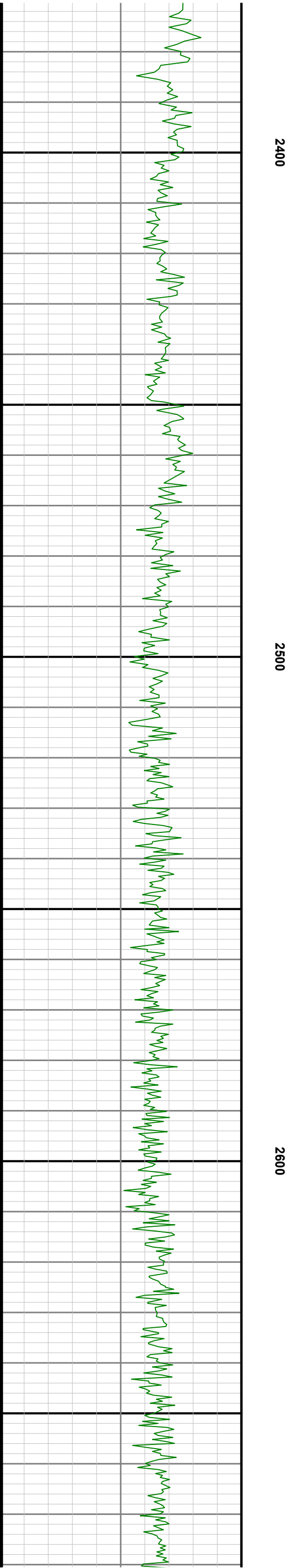
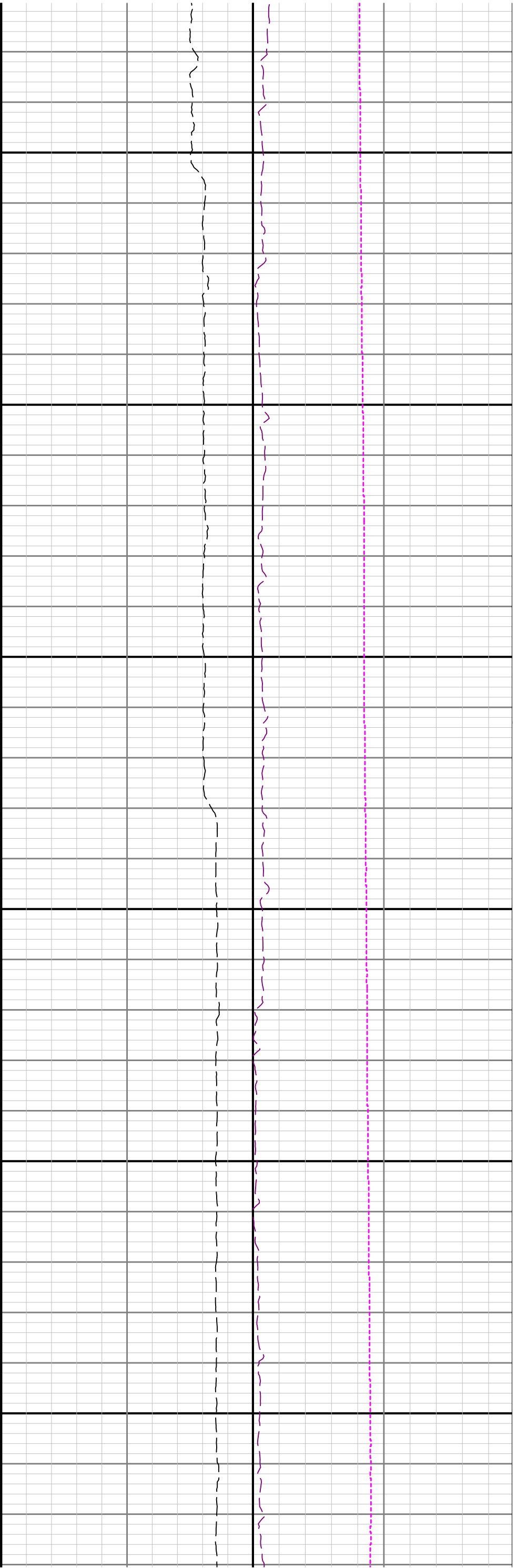
Remarks				
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	1913.00	8.500	1	Gamma Ray logging operations began at 1913 feet MD (1913 feet TVD)

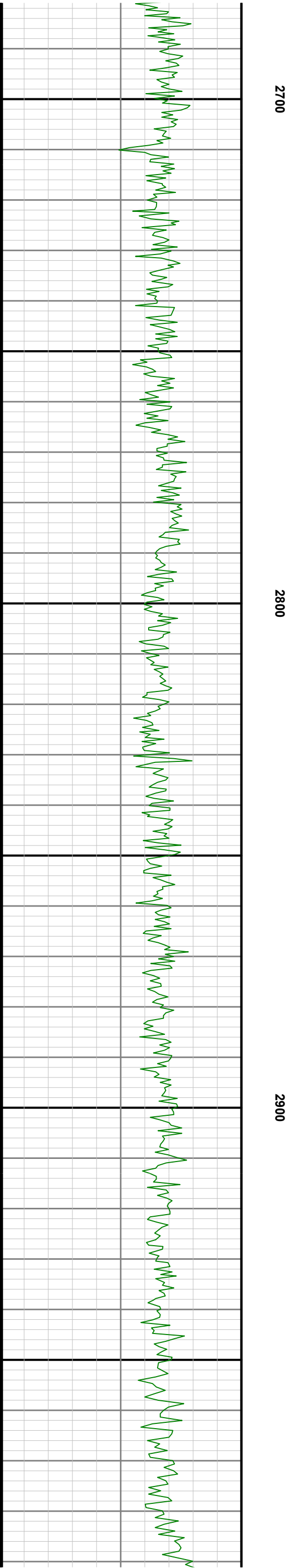
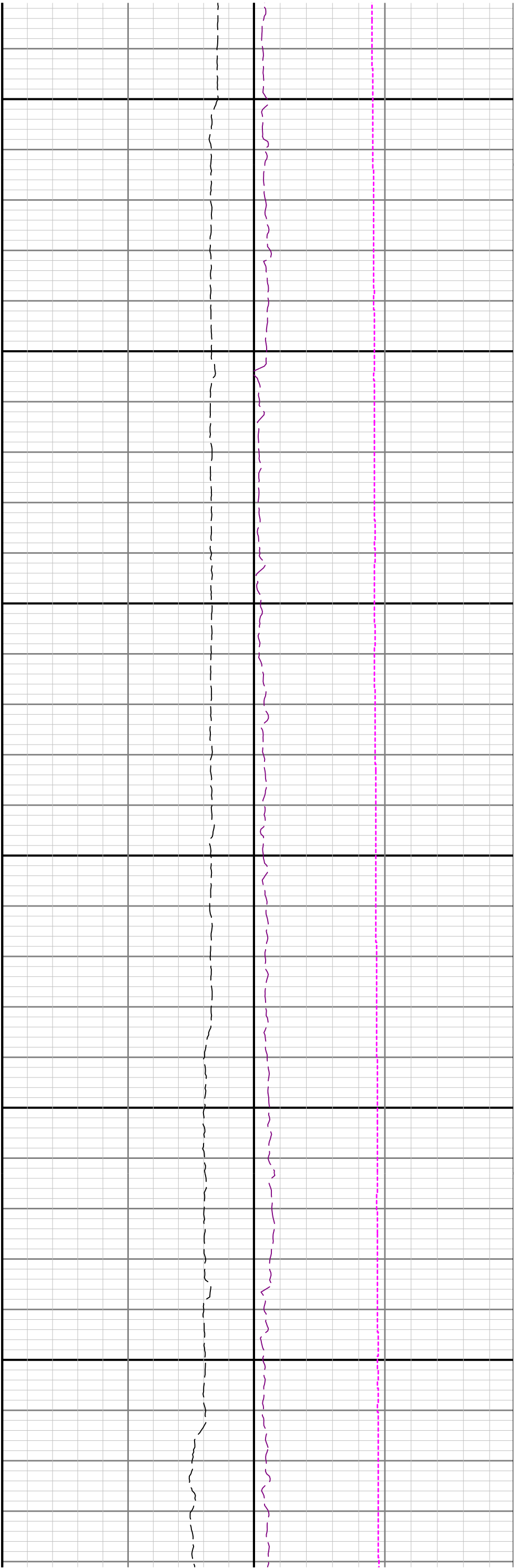
Curve Mnemonics		
Presented Curves	Description	Units
ROPA	Depth Averaged ROP 3 ft Average	ft/h
GRAM	Gamma Ray - Apparent 0.5 ft Average	API
TCDM	Downhole Temperature	degF
WOBA	Weight On Bit, Average 1 ft Average	klb

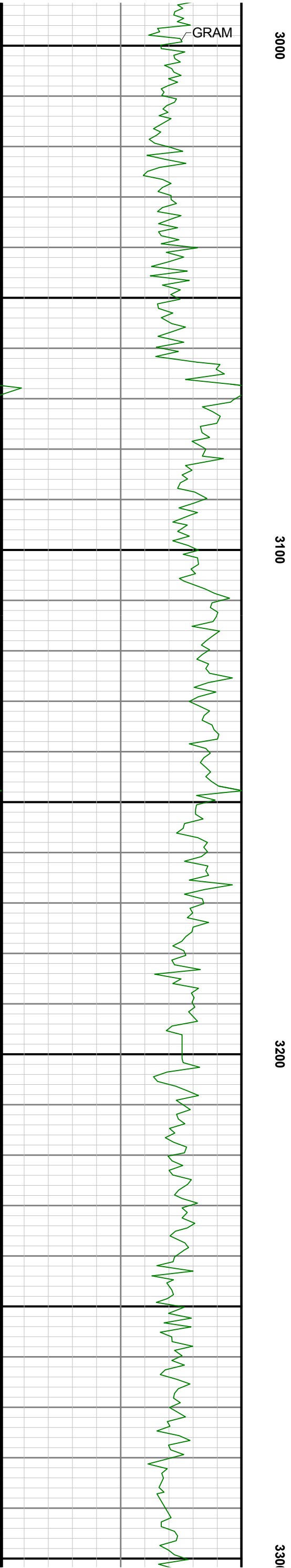
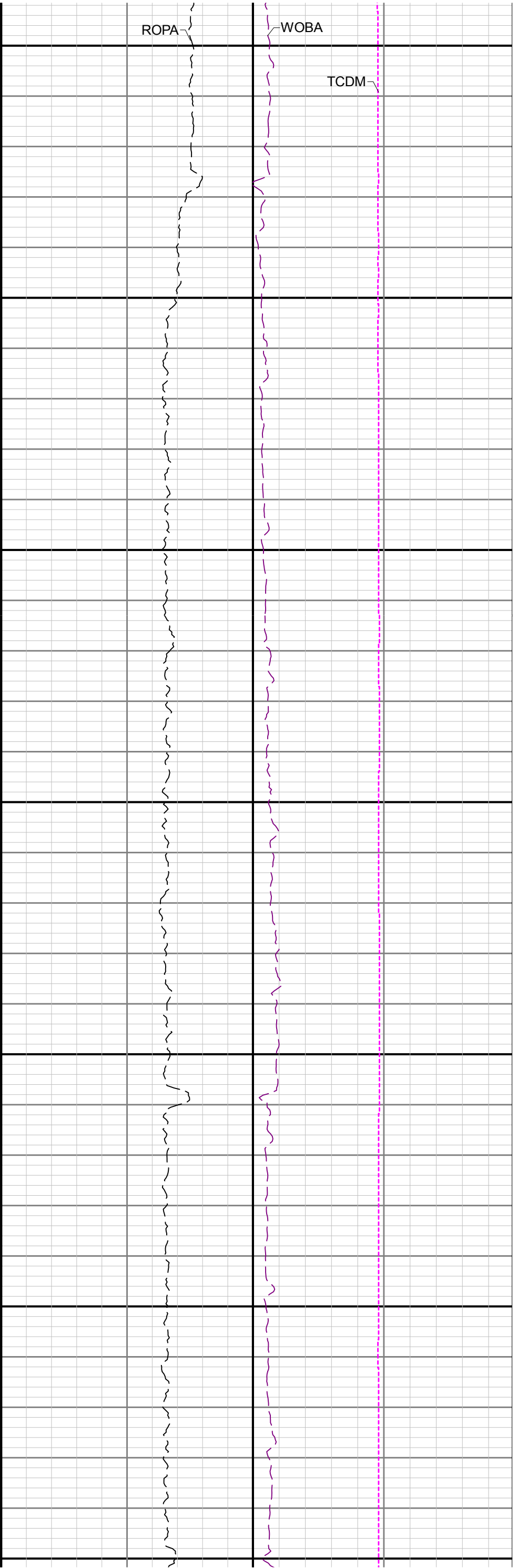
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	Well	ANNI LD29-755		
	Interval	Date From:	2016-10-22 09:43:04	Top: 1913.00
	Created	Date To:	2016-10-23 08:28:43	Bottom: 5938.00
		2016-10-25 01:51		

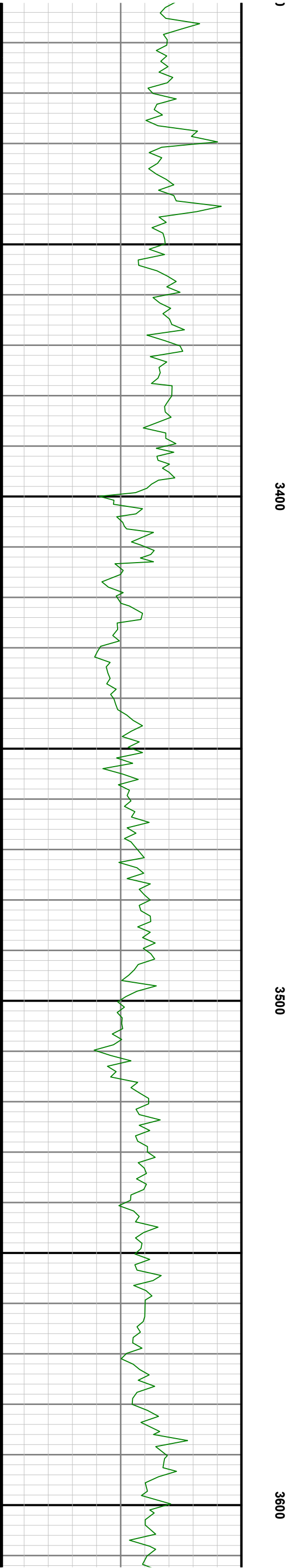


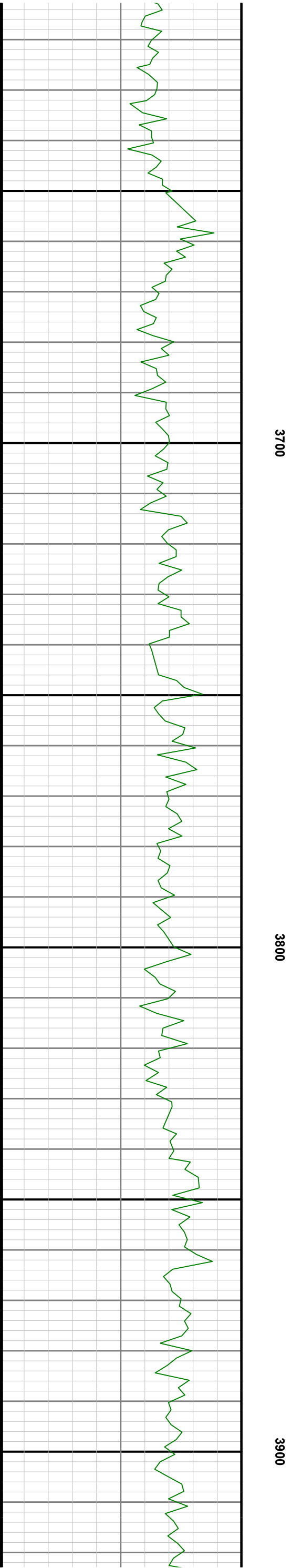
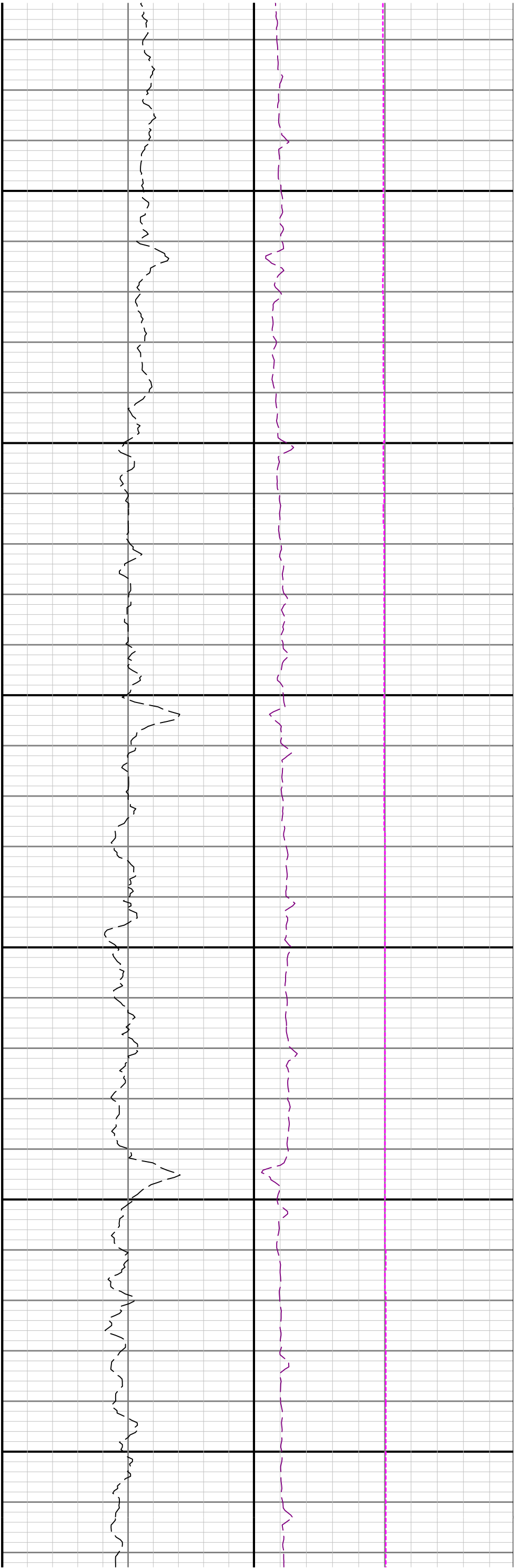


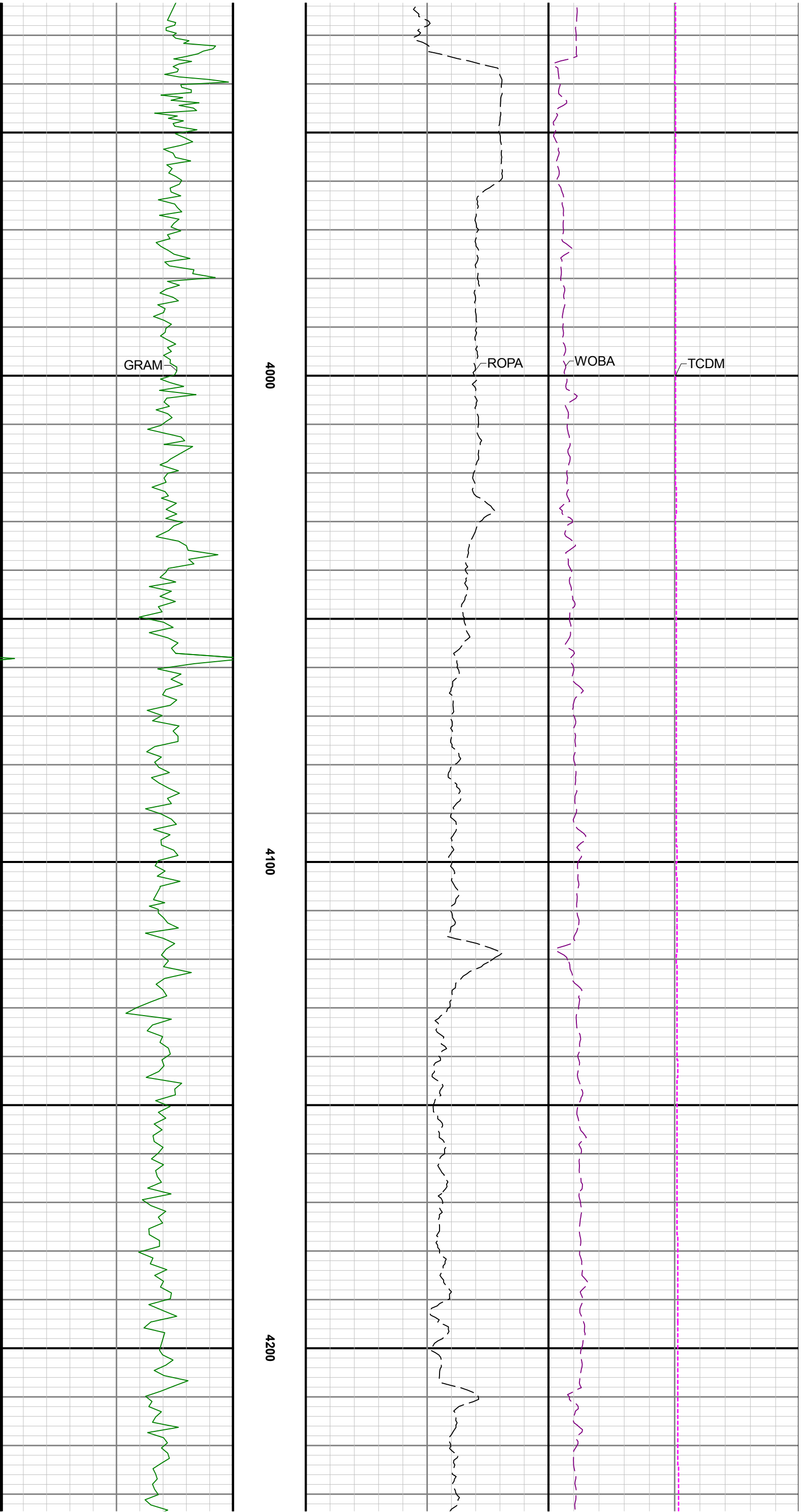


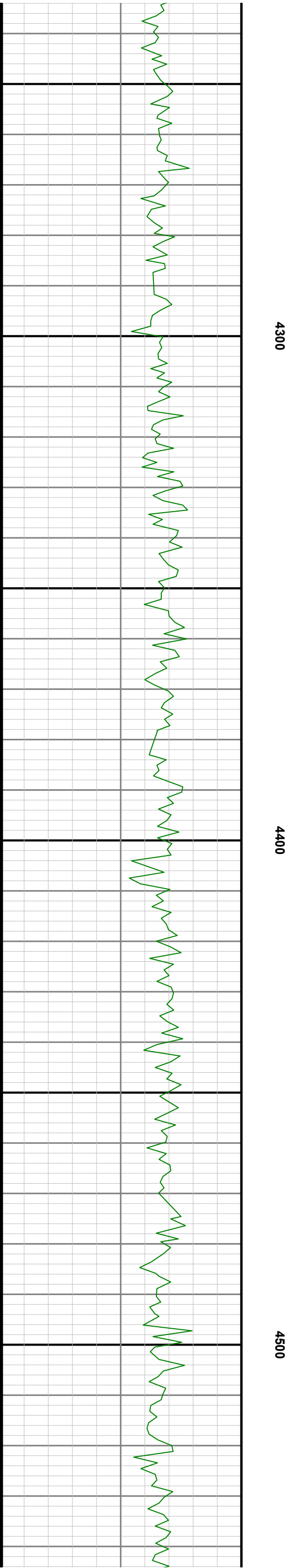
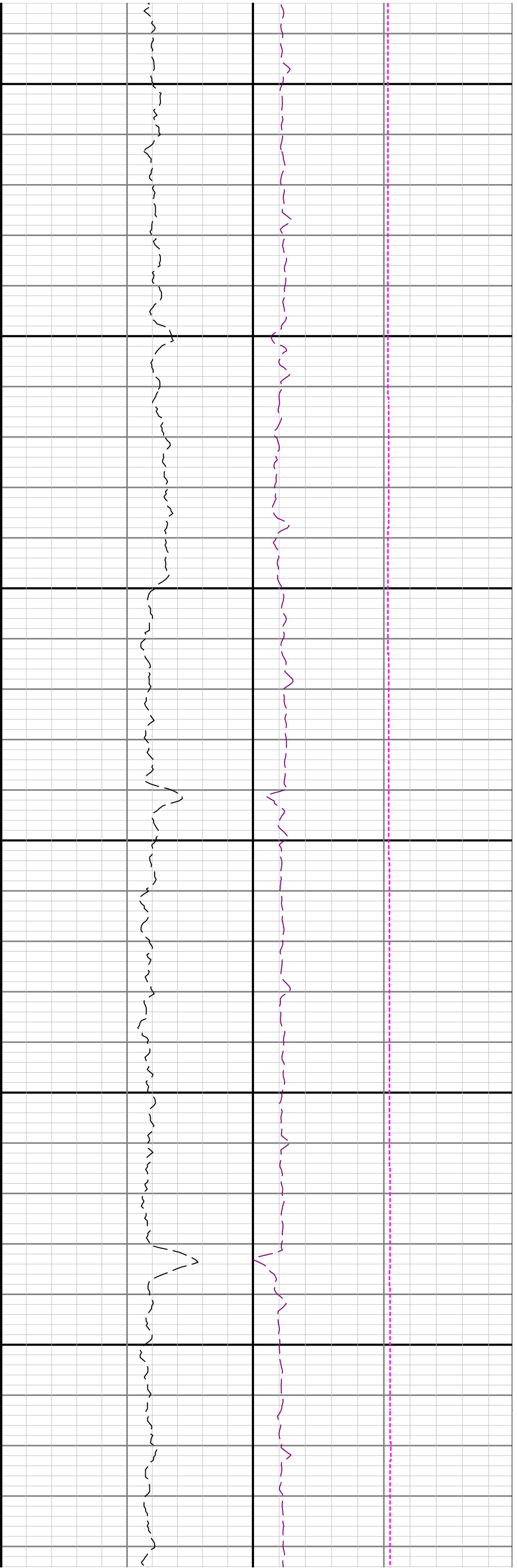


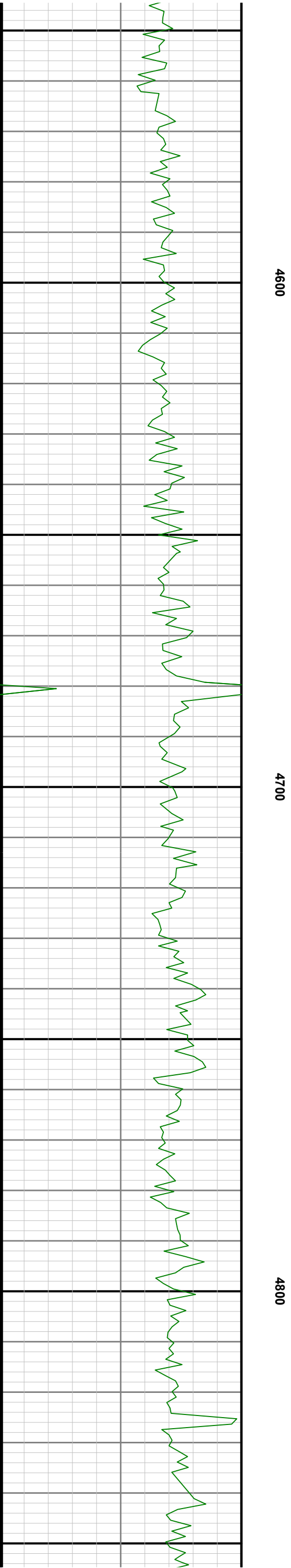
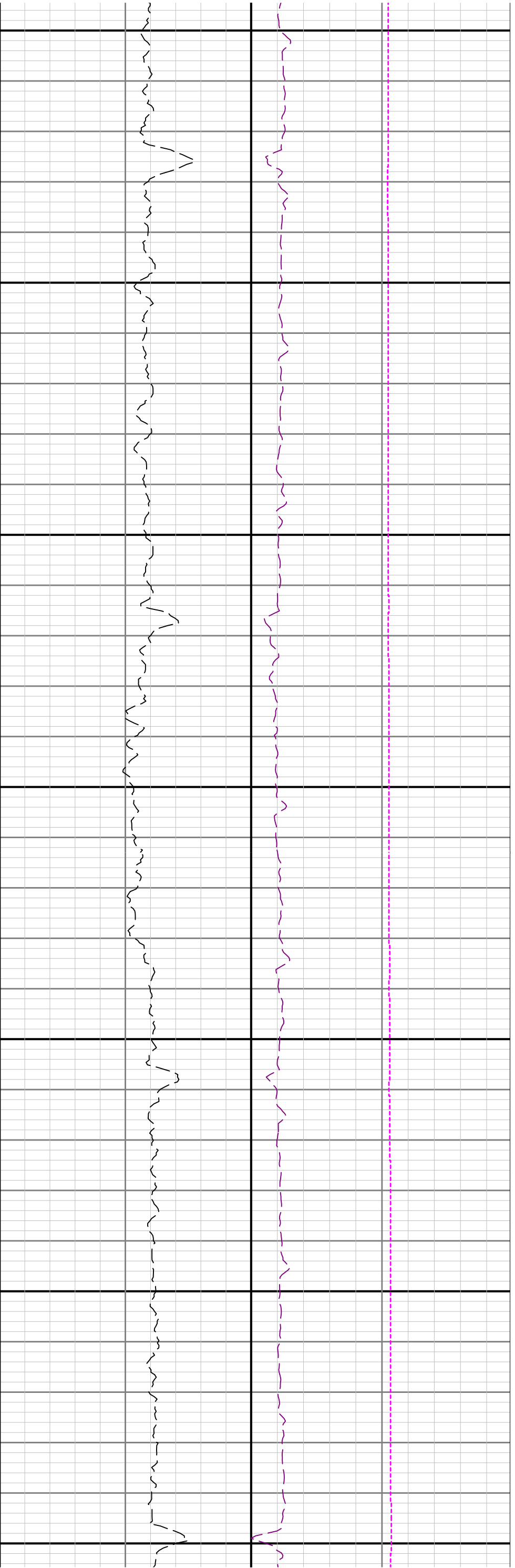


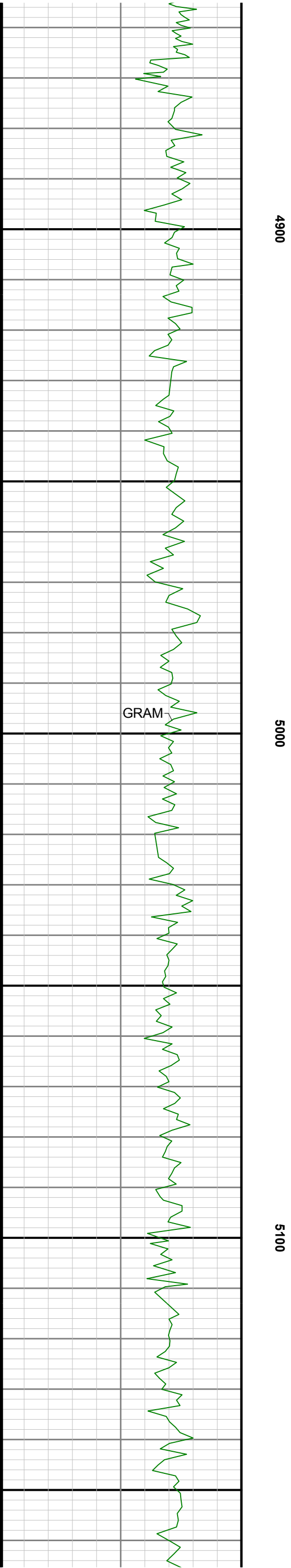
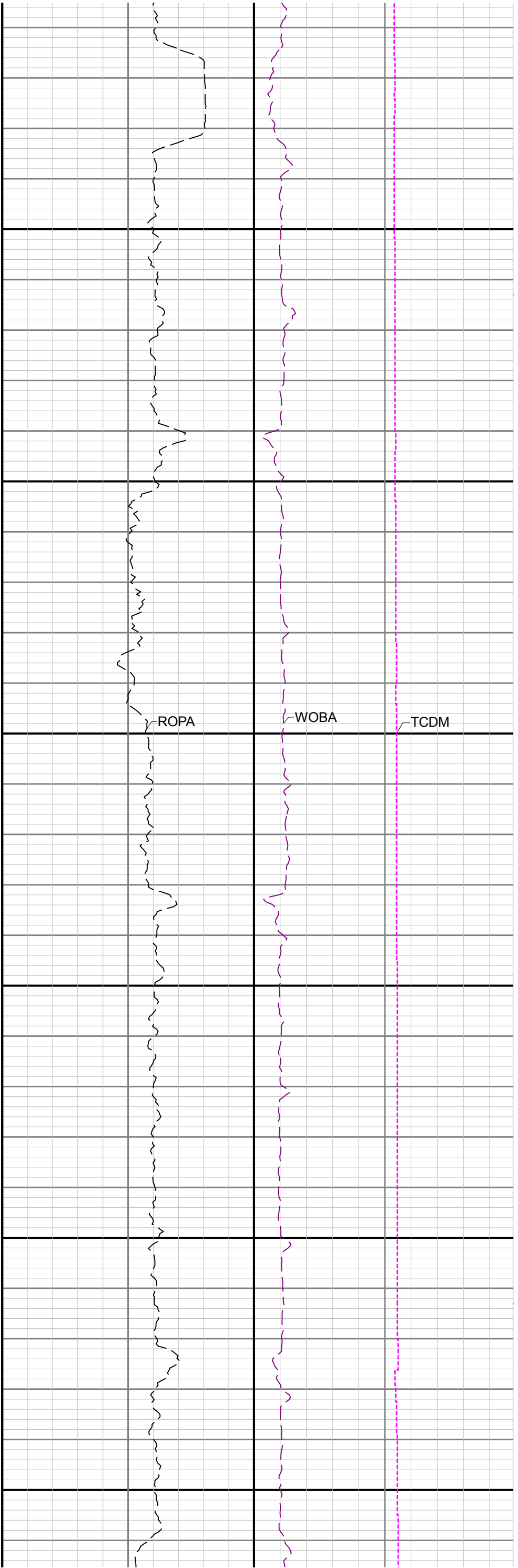


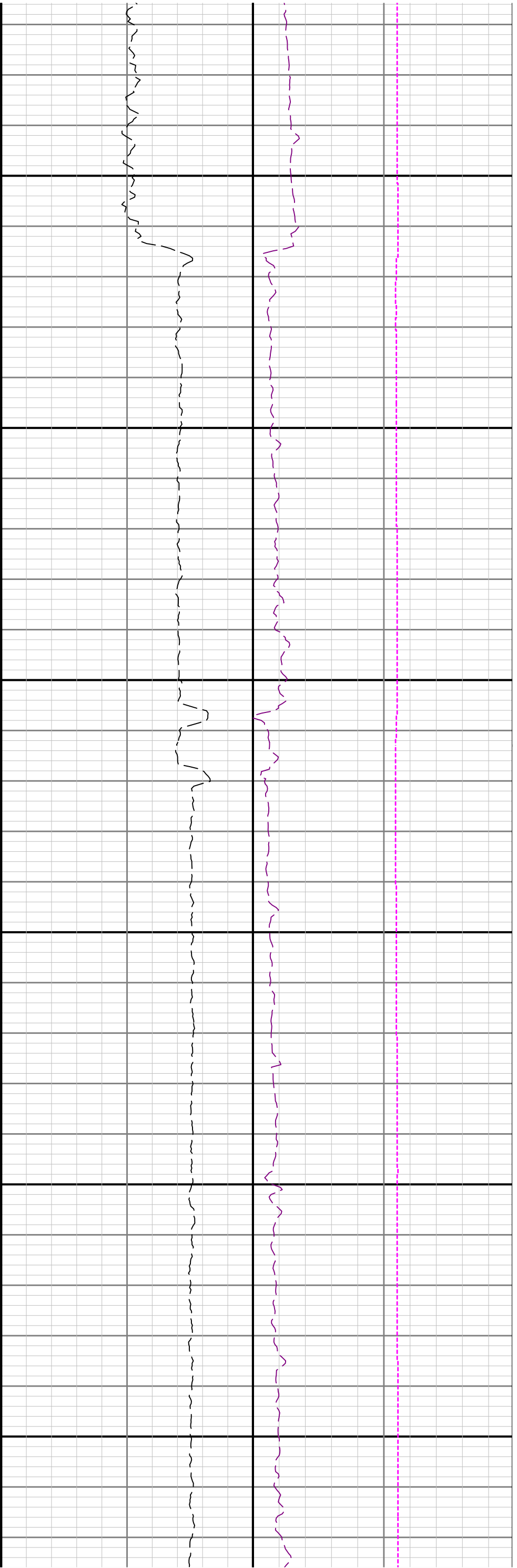








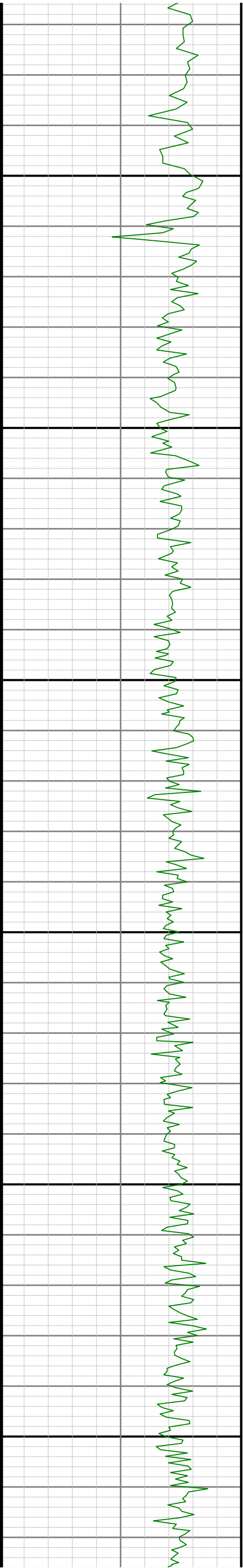


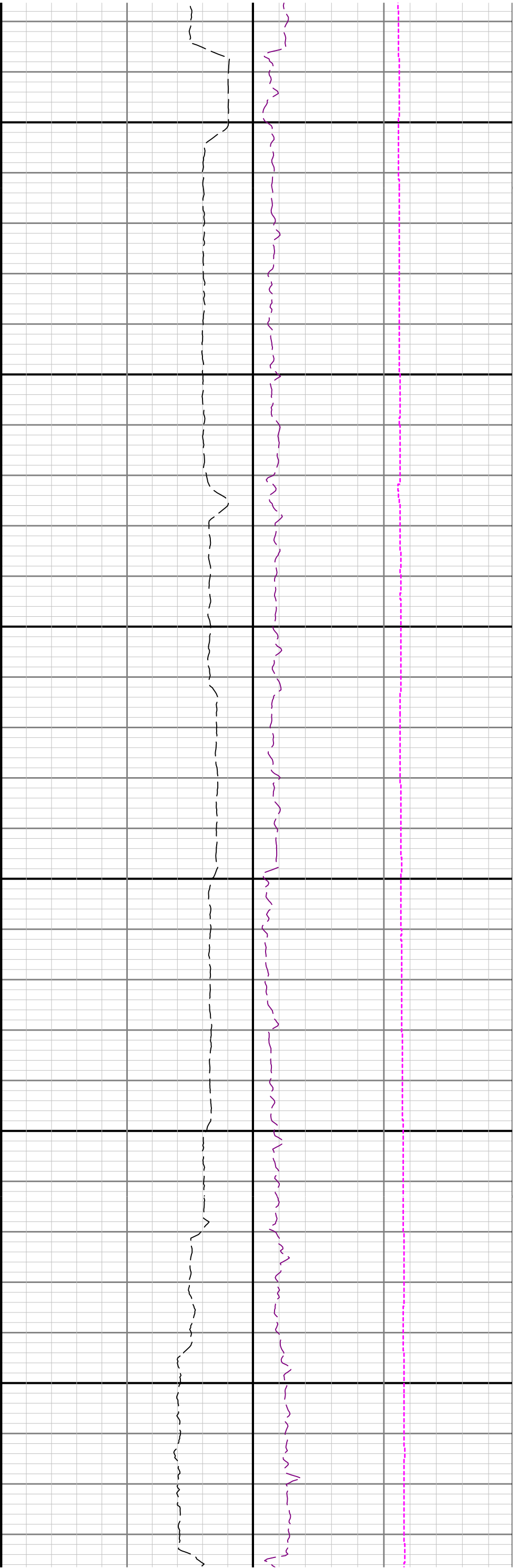


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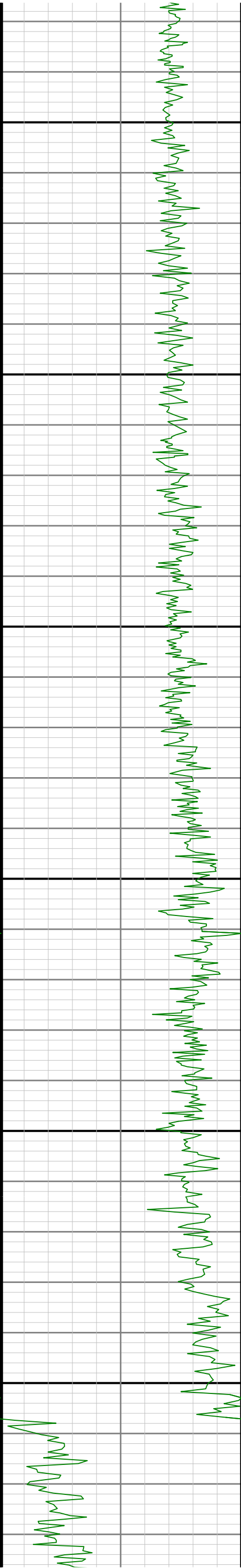




5500

5600

5700



	2170.00	1.27	140.49	N/A	-3.59	8.96	2169.89	5.28	95.00	2.04	0.54	151.00
	2265.00	3.27	143.89	N/A	-6.59	11.23	2264.81	8.67	95.00	2.11	2.11	3.58
	2359.00	4.12	158.40	N/A	-11.90	14.05	2358.61	14.43	94.00	1.34	0.90	15.44
	2454.00	6.39	165.83	N/A	-20.20	16.60	2453.21	23.07	95.00	2.49	2.39	7.82
	2548.00	9.37	149.14	N/A	-31.84	21.81	2546.32	35.51	94.00	3.97	3.17	-17.76
	2643.00	11.95	137.29	N/A	-45.71	32.45	2639.69	51.21	95.00	3.55	2.72	-12.47
	2738.00	14.58	123.38	N/A	-59.52	49.12	2732.17	68.03	95.00	4.33	2.77	-14.64
	2832.00	16.60	109.74	N/A	-70.57	71.64	2822.73	83.30	94.00	4.44	2.15	-14.51
	2927.00	16.00	92.42	N/A	-75.71	97.51	2913.97	93.43	95.00	5.14	-0.63	-18.23
	3021.00	16.01	86.38	N/A	-75.44	123.40	3004.33	98.27	94.00	1.77	0.01	-6.43
	3116.00	16.12	80.03	N/A	-72.33	149.46	3095.63	100.35	95.00	1.85	0.12	-6.68
	3211.00	15.83	77.96	N/A	-67.34	175.12	3186.96	100.52	95.00	0.67	-0.31	-2.18
	3305.00	15.98	74.14	N/A	-61.13	200.11	3277.36	99.35	94.00	1.12	0.16	-4.06
	3400.00	16.00	70.86	N/A	-53.26	225.06	3368.69	96.55	95.00	0.95	0.02	-3.45
	3494.00	15.96	66.69	N/A	-43.90	249.17	3459.06	92.12	94.00	1.22	-0.04	-4.44
	3589.00	15.94	68.50	N/A	-33.95	273.30	3550.40	87.12	95.00	0.52	-0.02	1.91
	3684.00	15.97	69.31	N/A	-24.55	297.66	3641.75	82.70	95.00	0.24	0.03	0.85
	3778.00	15.90	70.45	N/A	-15.68	321.89	3732.13	78.77	94.00	0.34	-0.07	1.21
	3873.00	15.94	72.70	N/A	-7.44	346.61	3823.49	75.57	95.00	0.65	0.04	2.37
	3967.00	15.17	81.06	N/A	-1.69	371.09	3914.06	74.75	94.00	2.52	-0.82	8.89
	4062.00	15.76	85.11	N/A	1.34	396.22	4005.62	76.73	95.00	1.29	0.62	4.26
	4156.00	15.86	83.93	N/A	3.79	421.71	4096.07	79.36	94.00	0.36	0.11	-1.26
	4251.00	15.94	83.34	N/A	6.67	447.58	4187.43	81.62	95.00	0.19	0.08	-0.62
	4345.00	15.89	83.10	N/A	9.71	473.17	4277.83	83.68	94.00	0.09	-0.05	-0.26
	4440.00	14.70	80.01	N/A	13.37	497.96	4369.46	84.98	95.00	1.52	-1.25	-3.25
	4535.00	14.58	80.62	N/A	17.41	521.63	4461.38	85.68	95.00	0.21	-0.13	0.64
	4629.00	14.62	80.66	N/A	21.26	545.00	4552.34	86.51	94.00	0.04	0.04	0.04
	4724.00	14.59	78.73	N/A	25.54	568.57	4644.27	86.95	95.00	0.51	-0.03	-2.03
	4819.00	14.56	84.84	N/A	28.96	592.20	4736.22	88.26	95.00	1.62	-0.03	6.43
	4913.00	14.61	88.29	N/A	30.37	615.82	4827.20	91.52	94.00	0.93	0.05	3.67
	5008.00	14.57	85.84	N/A	31.60	639.71	4919.13	95.03	95.00	0.65	-0.04	-2.58
	5102.00	14.41	89.85	N/A	32.49	663.20	5010.15	98.78	94.00	1.08	-0.17	4.27
	5197.00	14.58	87.21	N/A	33.10	686.96	5102.12	102.86	95.00	0.72	0.18	-2.78
	5291.00	14.51	88.38	N/A	34.01	710.55	5193.11	106.62	94.00	0.32	-0.07	1.24
	5386.00	14.20	116.79	N/A	29.09	732.88	5285.26	115.84	95.00	7.35	-0.33	29.91
	5481.00	17.07	130.48	N/A	14.78	753.90	5376.76	134.01	95.00	4.90	3.02	14.41
	5575.00	22.07	135.82	N/A	-6.86	776.71	5465.31	159.72	94.00	5.64	5.32	5.68
	5670.00	28.24	139.97	N/A	-36.90	803.64	5551.27	194.47	95.00	6.75	6.49	4.37
	5764.00	37.05	145.75	N/A	-77.43	833.94	5630.36	240.17	94.00	9.93	9.37	6.15
	5859.00	43.54	158.42	N/A	-131.66	862.16	5702.90	298.90	95.00	10.98	6.83	13.34
	5953.00	46.65	172.48	N/A	-195.83	878.59	5769.42	365.05	94.00	11.08	3.31	14.96
	6048.00	55.63	179.06	N/A	-269.47	883.77	5829.00	438.27	95.00	10.87	9.45	6.93
	6142.00	65.49	175.27	N/A	-351.10	887.94	5875.16	519.13	94.00	11.06	10.49	-4.03
	6237.00	76.33	174.59	N/A	-440.39	895.88	5906.19	608.23	95.00	11.43	11.41	-0.72
	6331.00	80.85	176.02	N/A	-532.20	903.41	5924.78	699.72	94.00	5.03	4.81	1.52
	6426.00	86.77	177.24	N/A	-626.44	908.96	5935.02	793.21	95.00	6.36	6.23	1.28
	6520.00	90.03	177.13	N/A	-720.28	913.57	5937.64	886.12	94.00	3.47	3.47	-0.12
	6615.00	90.00	175.52	N/A	-815.08	919.66	5937.62	980.26	95.00	1.70	-0.03	-1.69
	6709.00	90.09	174.22	N/A	-908.70	928.06	5937.54	1073.70	94.00	1.39	0.10	-1.38
	6804.00	90.62	174.05	N/A	-1003.20	937.77	5936.95	1168.26	95.00	0.59	0.56	-0.18
	6898.00	90.58	175.22	N/A	-1096.78	946.56	5935.97	1261.74	94.00	1.25	-0.04	1.24
	6993.00	90.52	176.14	N/A	-1191.51	953.72	5935.06	1356.02	95.00	0.97	-0.06	0.97
	7088.00	90.46	176.89	N/A	-1286.33	959.49	5934.24	1450.12	95.00	0.79	-0.06	0.79
	7182.00	90.55	177.03	N/A	-1380.19	964.47	5933.42	1543.13	94.00	0.18	0.10	0.15
	7277.00	90.59	177.78	N/A	-1475.09	968.78	5932.47	1637.01	95.00	0.79	0.04	0.79
	7371.00	90.62	179.56	N/A	-1569.05	970.96	5931.48	1729.57	94.00	1.89	0.03	1.89
	7465.00	90.37	179.12	N/A	-1663.04	972.04	5930.67	1821.93	94.00	0.54	-0.27	-0.47
	7560.00	90.37	176.63	N/A	-1757.97	975.56	5930.05	1915.69	95.00	2.62	0.00	-2.62
	7654.00	90.34	176.27	N/A	-1851.79	981.38	5929.47	2008.81	94.00	0.38	-0.03	-0.38
	7749.00	90.37	180.90	N/A	-1946.73	983.73	5928.88	2102.36	95.00	4.87	0.03	4.87
	7843.00	90.34	179.27	N/A	-2040.73	983.59	5928.30	2194.49	94.00	1.73	-0.03	-1.73
	7938.00	90.28	176.20	N/A	-2135.64	987.34	5927.78	2288.28	95.00	3.23	-0.06	-3.23
	8032.00	90.25	177.13	N/A	-2229.48	992.81	5927.35	2381.36	94.00	0.99	-0.03	0.99
	8127.00	90.34	175.52	N/A	-2324.28	998.90	5926.86	2475.50	95.00	1.70	0.09	-1.69
	8221.00	90.28	177.97	N/A	-2418.12	1004.24	5926.35	2568.55	94.00	2.61	-0.06	2.61
	8316.00	90.43	181.86	N/A	-2513.10	1004.38	5925.76	2661.70	95.00	4.10	0.16	4.09
	8410.00	90.22	185.81	N/A	-2606.87	998.09	5925.23	2752.39	94.00	4.21	-0.22	4.20
	8505.00	90.12	182.98	N/A	-2701.58	990.81	5924.95	2843.81	95.00	2.98	-0.11	-2.98
	8600.00	90.22	179.38	N/A	-2796.54	988.86	5924.67	2936.53	95.00	3.79	0.11	-3.79
	8694.00	90.09	177.55	N/A	-2890.50	991.37	5924.41	3029.15	94.00	1.95	-0.14	-1.95
	8789.00	90.15	176.57	N/A	-2985.38	996.25	5924.21	3123.12	95.00	1.03	0.06	-1.03
	8883.00	90.25	177.43	N/A	-3079.25	1001.17	5923.88	3216.12	94.00	0.92	0.11	0.91
	8978.00	90.00	176.93	N/A	-3174.13	1005.84	5923.68	3310.07	95.00	0.59	-0.26	-0.53
	9072.00	90.09	176.87	N/A	-3267.99	1010.92	5923.60	3403.09	94.00	0.12	0.10	-0.06
	9167.00	90.09	176.43	N/A	-3362.83	1016.47	5923.45	3497.17	95.00	0.46	0.00	-0.46
	9356.00	90.25	178.44	N/A	-3551.63	1024.93	5922.89	3683.93	189.00	1.07	0.08	1.06
	9451.00	90.03	178.91	N/A	-3646.60	1027.13	5922.66	3777.48	95.00	0.55	-0.23	0.49
	9546.00	90.09	181.15	N/A	-3741.60	1027.08	5922.56	3870.60	95.00	2.36	0.06	2.36
	9640.00	90.31	180.11	N/A	-3835.59	1026.05	5922.23	3962.55	94.00	1.13	0.23	-1.11
	9735.00	90.40	181.04	N/A	-3930.58	1025.09	5921.65	4055.49	95.00	0.98	0.09	0.98
	9829.00	90.31	179.40	N/A	-4024.58	1024.73	5921.06	4147.58	94.00	1.75	-0.10	-1.74
	9924.00	90.34	177.55	N/A	-4119.54	1027.26	5920.52	4241.17	95.00	1.95	0.03	-1.95
	10019.00	90.28	178.80	N/A	-4214.49	1030.29	5920.01	4334.86	95.00	1.32	-0.06	1.32
	10113.00	90.43	178.53	N/A	-4308.46	1032.48	5919.43	4427.42	94.00	0.33	0.16	-0.29
	10208.00	90.37	178.70	N/A	-4403.43	1034.77	5918.76	4520.98	95.00	0.19	-0.06	0.18
	10397.00	90.40	181.04	N/A	-4592.41	1035.20	5917.49	4706.35	189.00	1.24	0.02	1.24
	10492.00	90.37	180.21	N/A	-4687.40	1034.16	5916.86	4799.27	95.00	0.87	-0.03	-0.87
	10586.00	90.37	178.85	N/A	-4781.40	1034.93	5916.25	4891.58	94.00	1.45	0.00	-1.45
	10681.00	90.34	175.78	N/A	-4876.28	1039.38	5915.66	4985.48	95.00	3.23	-0.03	-3.23
	10775.00	90.25	175.58	N/A	-4970.01	1046.47	5915.18	5078.77	94.00	0.23	-0.10	-0.21
	10870.00	90.34	177.07	N/A	-5064.81	1052.55	5914.69	5172.91	95.00	1.57	0.09	1.57
	10964.00	90.31	177.66	N/A	-5158.71	1056.88	5914.15	5265.82	94.00	0.63	-0.03	0.63
	11059.00	90.31	177.06	N/A	-5253.61	1061.25	5913.64	5359.72	95.00	0.63	0.00	-0.63
	11122.00	90.28	176.97	N/A	-5316.52	1064.53	5913.32	5422.05	63.00	0.15	-0.05	-0.14
Projection	11146.00	90.28	176.97	N/A	-5340.49	1065.80	5913.20	5445.79	24.00	0.00	0.00	0.00