

obligations shall be governed by Baker Hughes Incorporated's Worldwide Terms and Conditions."

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	Bottom	From	To	Start Logging	End Logging	
						(ft)	(ft)	(ft)	(ft)			
1	1	8.500	PDC	2.00	AutoTrak Curve	1952.00	1109.00	1952.00	11121.00	2017-06-13 15:36	2017-06-15 05:37	30.88

Crew

Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite	Name	Arrive Wellsite	Depart Wellsite
Ryan Wunderlich	2017-06-12	2017-06-15	Steven Cano	2017-06-12	2017-06-15			

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+ (%)
2017-06-13 01:47	1	1900.00	Oil Based Mud	9.0	9	N/A	N/A	77.5/22.5	Active Pit	27000	0.00
2017-06-14 07:20	1	6222.00	Oil Based Mud	9.3	10	N/A	N/A	74.7/25.3	Active Pit	32300	0.00
2017-06-15 08:03	1	10738.00	Oil Based Mud	9.3	11	N/A	N/A	74.8/25.2	Active Pit	25000	0.00

Mud Resistivity Record

Date / Time	Run No.	Measured Depth (ft)	Surface Temp (degF)	Surface			BHCT (degF)	Downhole		
				Rm	Rmf	Rmc		Rm @ BHCT	Rmf @ BHCT	Rmc @ BHCT
				(ohm.m)	(ohm.m)	(ohm.m)		(ohm.m)	(ohm.m)	(ohm.m)
2017-06-15 08:29	1	11121.00	90.0	100.000	N/A	N/A	200.0	100.000	N/A	N/A

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	OnTrak	12858682	Pressure	1.23	5602.02	6.750	0.000
1	OnTrak	12858682	Gamma (double)	2.12	5602.91	6.750	0.000
1	OnTrak	12858682	Resistivity (4tx)	6.16	5606.95	6.750	0.000
1	OnTrak	12858682	Directional (mag)	11.95	5612.74	6.750	0.000

Service and Tool Mnemonics

Mnemonic	Name	Description
OTK	OnTrak	Sensor Sub (Inc, Azi, Temp, Azimuthal GR, Res, AP, VSS), OnTrak Platform
BCPM	BCPM	Bi-Directional Communication and Power Module, OnTrak Platform

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 Ontrak services (Multiple Propagation Resistivity, Gamma Ray, and Directional) behind a 8 1/2 inch bit and rotary steerable assembly to perform a MAD (Measurement After Drilling) Pass from 1952 to 11121 feet MD (1952 to 6166 feet TVD). The data collected during this run was ream logged up to 12 hours after being drilled and it is presented independent of the drilling log.

Remarks

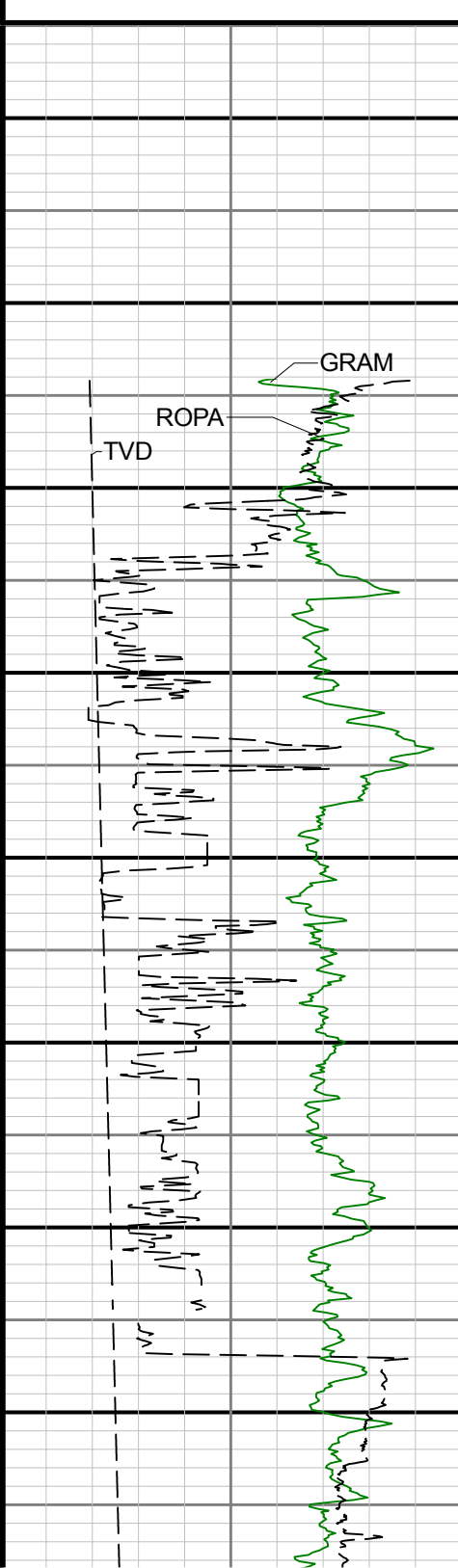
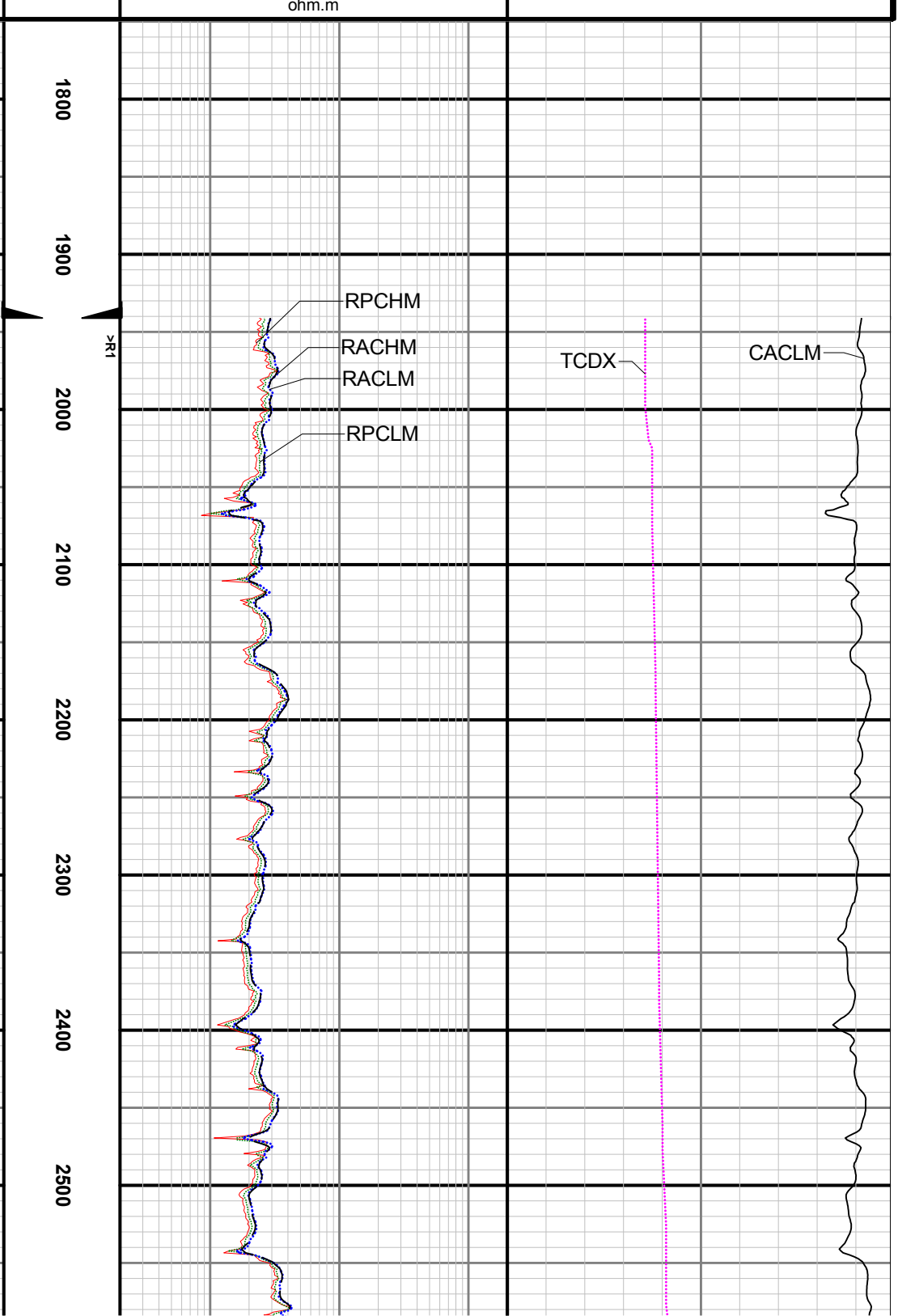
Number	Measured Depth (ft)	Hole Section (in)	Run No.	Remark
1	5596.00	8.500	1	The interval from 5596 to 11121 feet MD (5586 to 6115 feet TVD) due to sensor to bit offset at well TD.

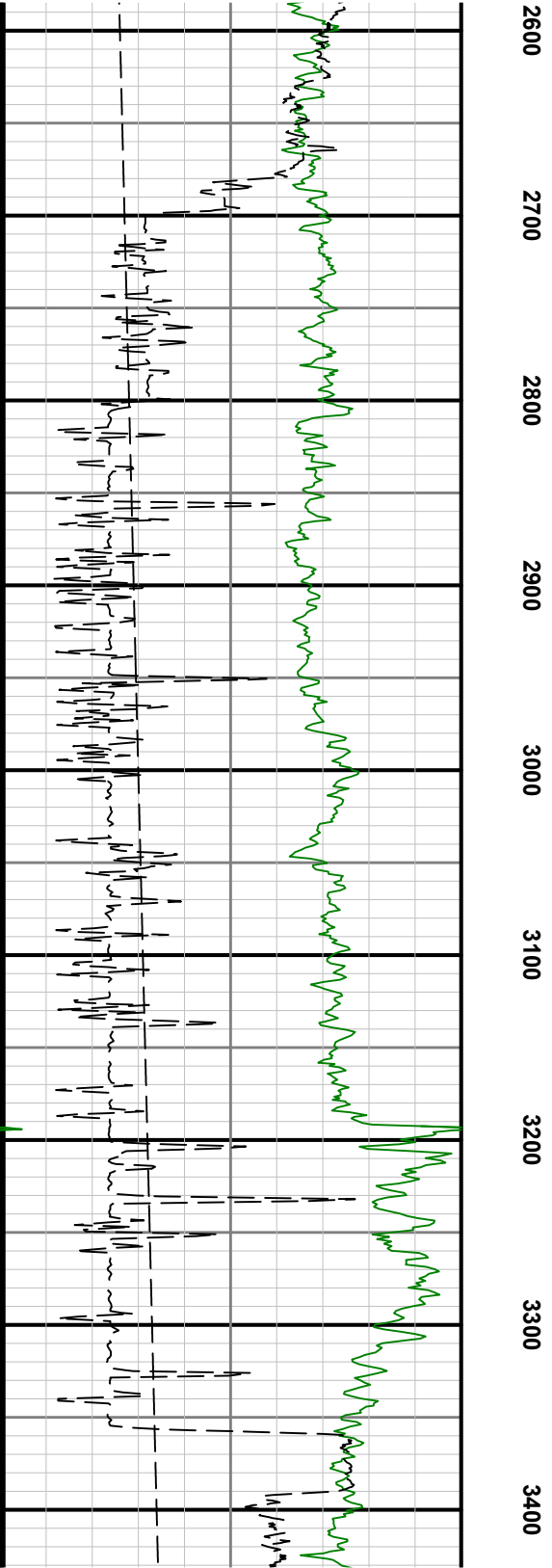
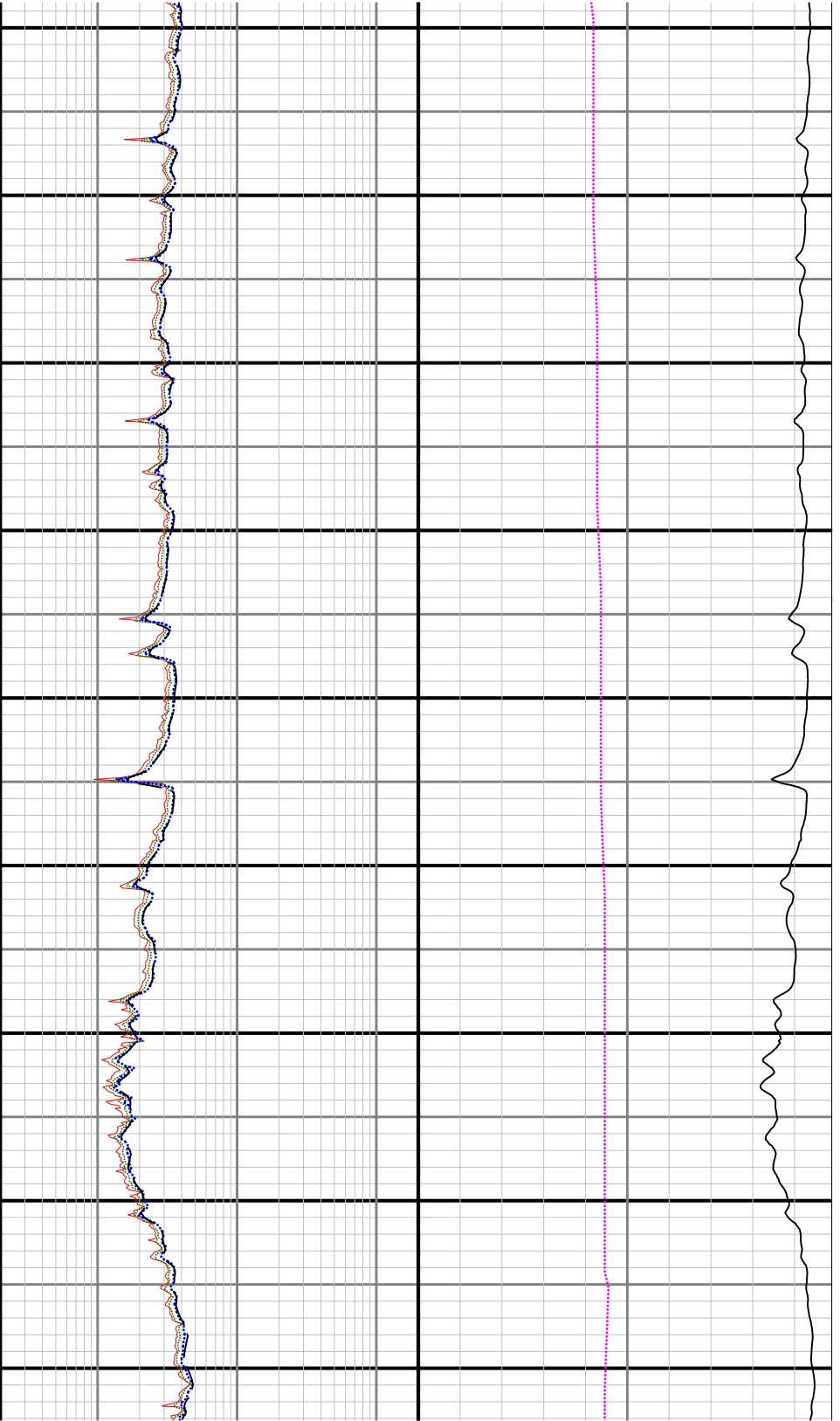
Curve Mnemonics

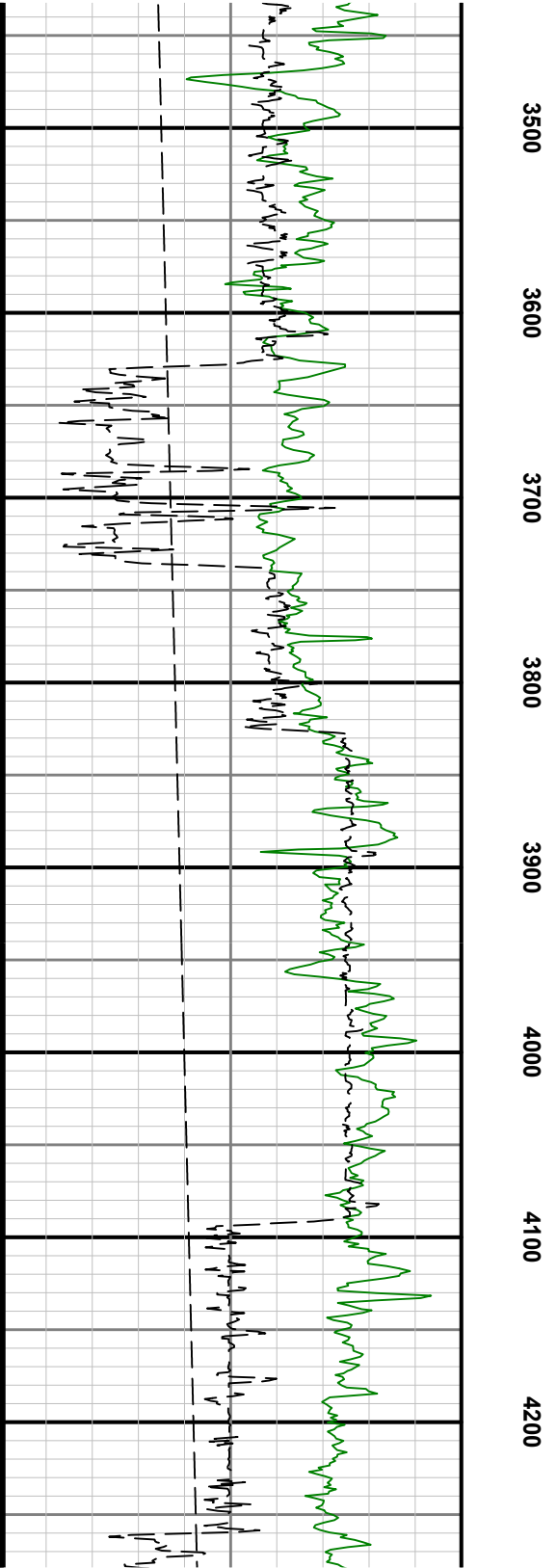
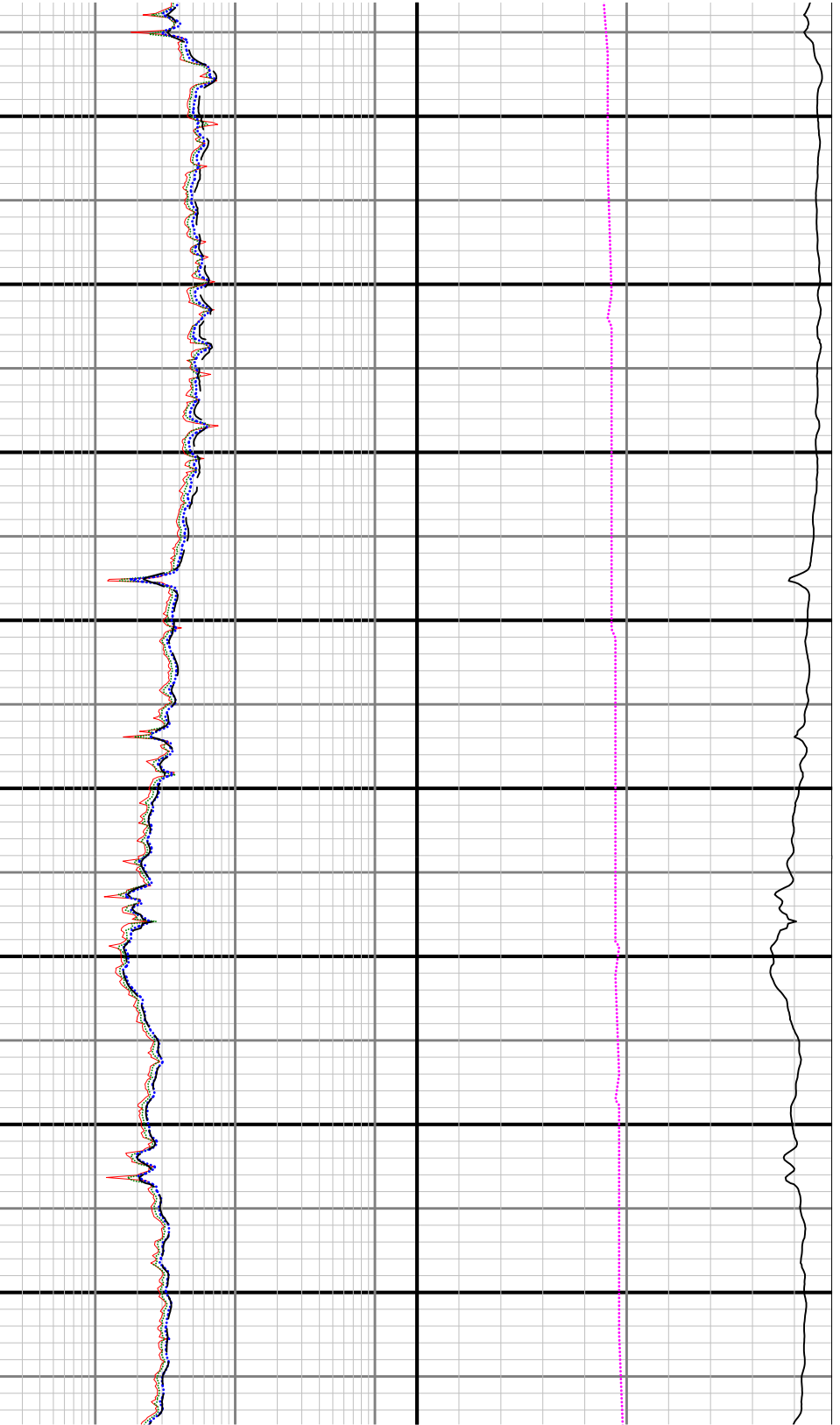
Presented Curves	Description	Units
CACLM	Conductivity Attenuation - Corrected - 400kHz	mmho/m
RACHM	Resistivity Attenuation - Corrected - 2MHz	ohm.m
RACLM	Resistivity Attenuation - Corrected - 400kHz	ohm.m
RPCHM	Resistivity Phase - Corrected - 2MHz	ohm.m
RPCLM	Resistivity Phase - Corrected - 400kHz	ohm.m
TCDX	Downhole Temperature	degF
ROPA	Depth Averaged ROP 3 ft Average	ft/h
TVD	True Vertical Depth	ft
GRAM	Gamma Ray - Apparent 3 ft Average	API

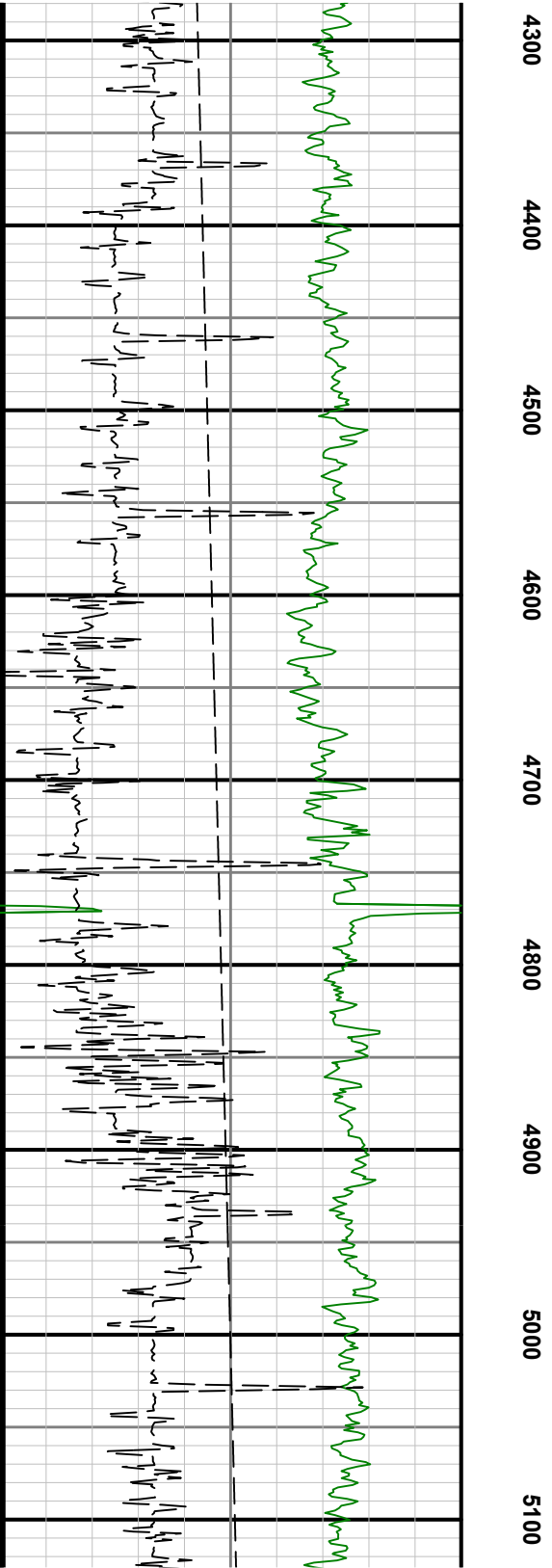
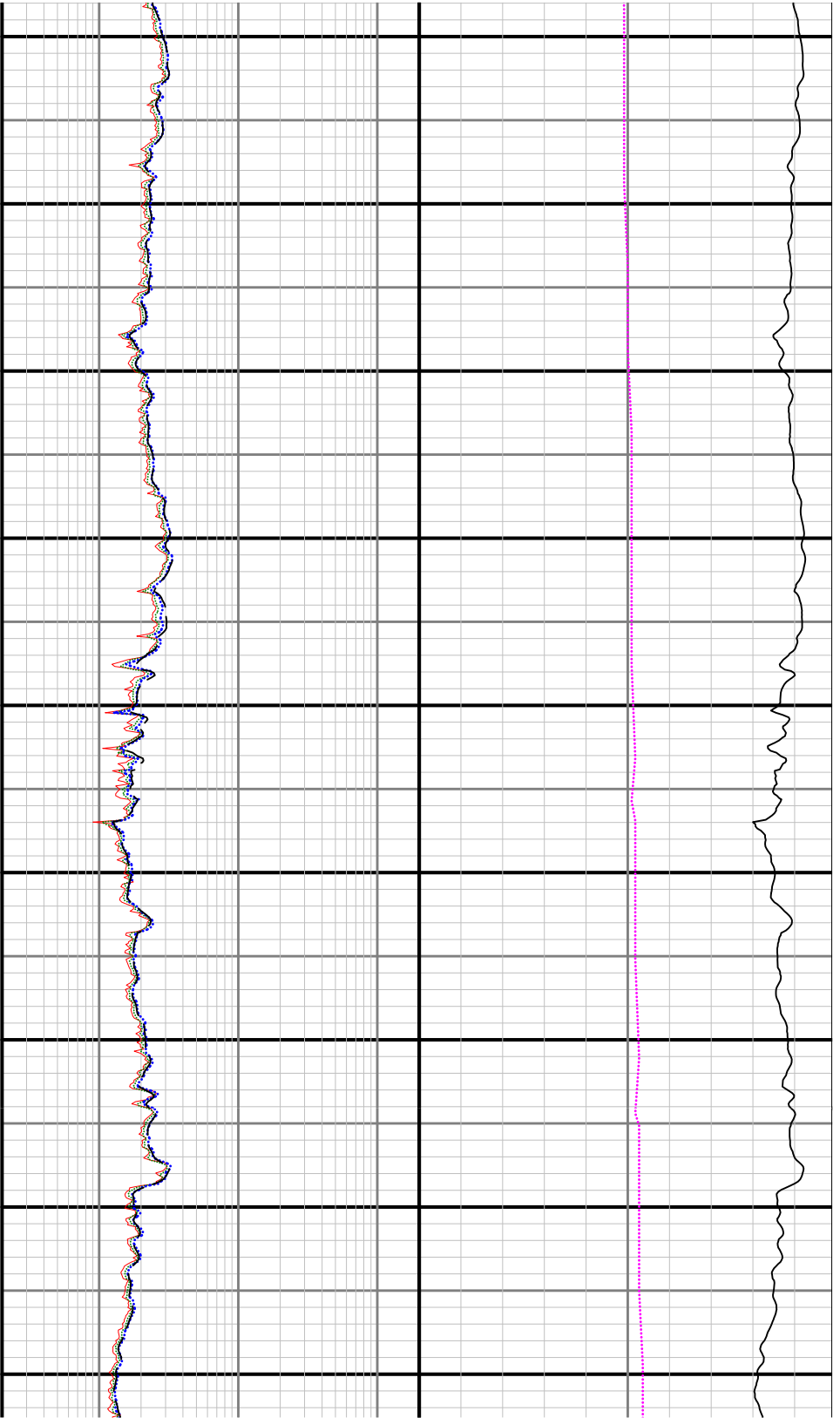
	Company	Noble Energy			
	Well	Constitution Federal LC21-655			
	Interval	Date From:	2017-06-14 10:23:58	Top:	1941.00
	Created	Date To:	2017-06-15 10:24:07	Bottom:	5530.00
		2017-06-15 16:23			

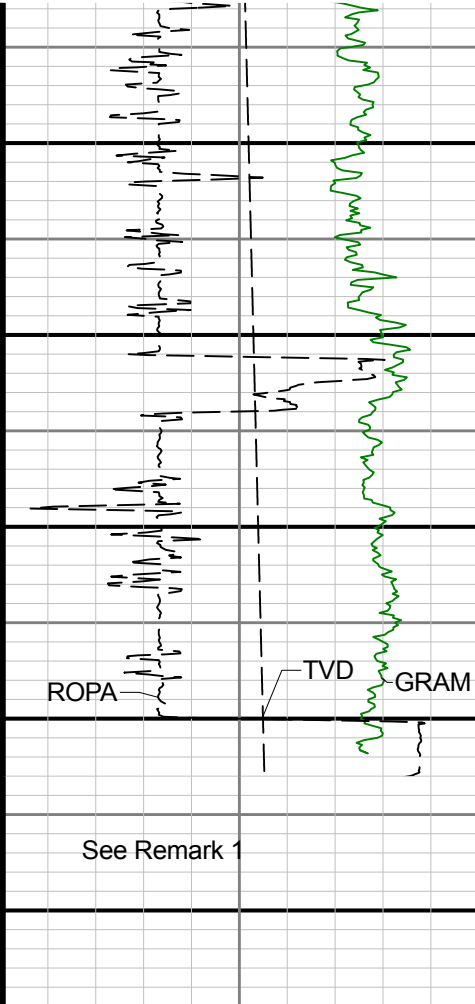
<div><div>Gamma Ray - Apparent 3 ft Average [GRAM]</div><div>0150</div><div>API</div><div>Depth Averaged ROP 3 ft Average [ROPA]</div><div>12000</div><div>ft/h</div><div>True Vertical Depth [TVD]</div><div>010000</div><div>ft</div></div>	MD 1:1200 feet	Resistivity Phase - Corrected - 2MHz [RPCHM]	Conductivity Attenuation - Corrected - 400kHz [CACLM]	
		0.2200	40000	
		ohm.m	mmho/m	
		Resistivity Phase - Corrected - 400kHz [RPCLM]	Tool Temperature [TCDX]	
		0.2200	0300	
		ohm.m	degF	
		Resistivity Attenuation - Corrected - 2MHz [RACHM]		
0.2200				
ohm.m				
Resistivity Attenuation - Corrected - 400kHz [RACLM]				
0.2200				



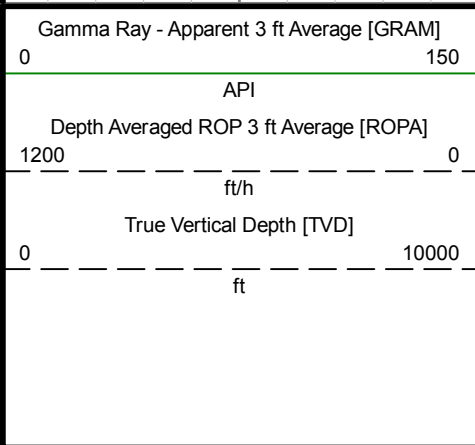
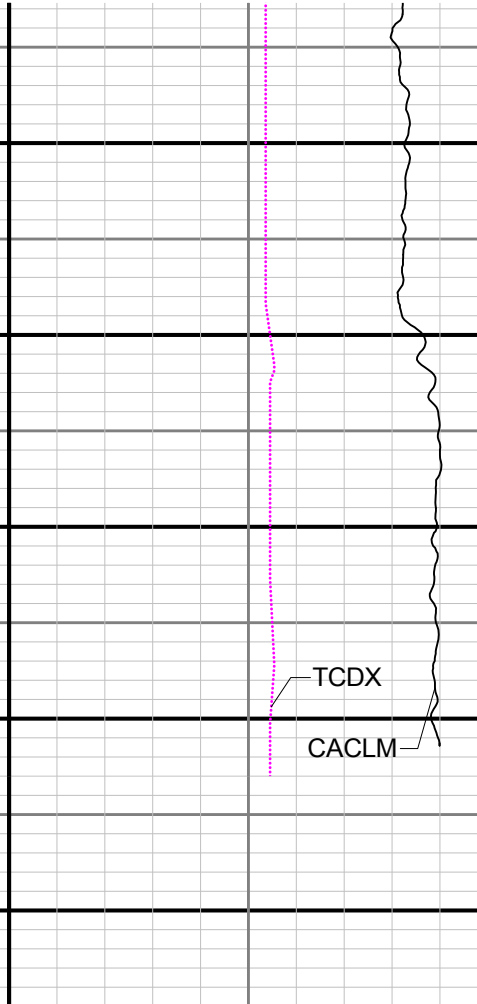
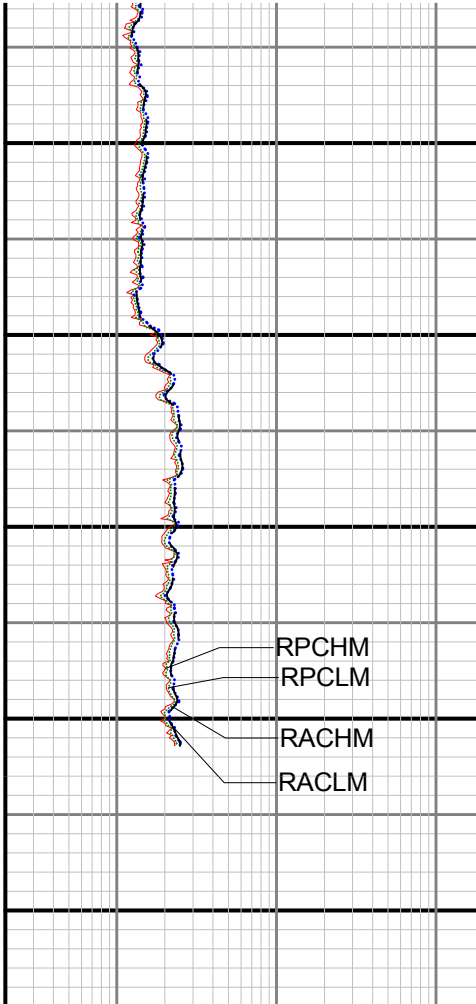








5200
5300
5400
5500
5600



MD 1:1200 feet

