HALLIBURTON | Sperry Drilling

EWR-Phase 4 Electromagnetic Wave Resistivity
PCD-C Pressure Case Directional
DGR Dual Gamma Ray

Powered by INSITE™

1 : 240

Country	: USA
Field	: Wattenburg
Location	: Lat: 40° 9' 13.28" North Long: 104° 40' 49.36" West
Well	: Nichols 1N-5HZ
Company	: Anadarko Petroleum Corp.
Rig	: H&P 308

Company	:	**Anadarko Petroleum Corp.**
Rig	:	**H&P 308**
Well	:	**Nichols 1N-5HZ**
Field	:	**Wattenburg**
Country	:	**USA**
API Number	:	**05-123-35877**

LOCATION

Latitude : **40° 9' 13.28" North**
Longitude : **104° 40' 49.36" West**

UTM Easting = **3,229,099.31 ft**
UTM Northing = **1,299,891.35 ft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level** Elevation : **4893.00 ft**
Log Measured From : **Drill Floor** **25.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

MD LOG

Elev. KB **N/A**
DF **4918.00 ft**
GL **4893.00 ft**
WD **N/A**

Depth Logged : **859.00 ft** To **14,151.00 ft**
Date Logged : **28-Dec-12** To **05-Jan-13**
Total Depth MD : **14,151.00 ft** TVD : **7,031.16 ft**
Spud Date : **28-Dec-12**

Unit No. : **11610114** Job No. : **CA-XX-0009810738**

Plot Type : **Final**
Plot Date : **18-Jan-13**

Run No.	Borehole Record (MD) Size	From	To
100	8.750 in	859.00 ft	969.00 ft
200	8.750 in	969.00 ft	6,743.00 ft
300	8.750 in	6,743.00 ft	7,416.00 ft
400	6.125 in	7,416.00 ft	14,151.00 ft

Run No.	Borehole Record (MD) Size	From	To

Casing Record (MD) Size	Weight	From	To
9.625 in	32.00 lbpf	SURFACE	859.00 ft
7.000 in	26.00 lbpf	SURFACE	7,403.00 ft

WELL INFORMATION

MWD Run Number	100	200	300	400
Date run completed	28-Dec-12	30-Dec-12	31-Dec-12	05-Jan-13
Rig Bit Number	100	200	300	400
Bit Size (in)	8.750	8.750	8.750	6.125
Tool Nominal OD (in)	6.750	6.750	6.750	4.750
Log Start Depth (MD, ft)	859.00	969.00	6,743.00	7,416.00
Log End Depth (MD, ft)	969.00	6,743.00	7,416.00	14,151.00
Drill or Wipe	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	28-Dec-12 13:35	28-Dec-12 19:00	30-Dec-12 21:40	02-Jan-13 07:30
Drill/Wipe End Date and Time	28-Dec-12 16:15	30-Dec-12 11:30	31-Dec-12 15:15	04-Jan-13 20:20
Min Inc (deg) @ Depth (MD, ft)	.24 @ 825.00	.07 @ 6,094.00	14.12 @ 6,756.00	89.51 @ 7,528.00
Max Inc (deg) @ Depth (MD, ft)	.24 @ 825.00	11.14 @ 6,725.00	83.44 @ 7,356.00	89.75 @ 7,433.00
Bit TFA(in2) / Bit Type	.52 / Tricone	.86 / PDC	.75 / Tricone	.61 / PDC
Flow Rate (gpm)	400.00	575.00	550.00	285.00
Max AV (fpm) / CV (fpm) @ MWD	473.0 / N/A	473.0 / N/A	N/A / N/A	533.0 / N/A
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel
Density (ppg) / Viscosity (spqt)	8.40 / 28.00	8.50 / 27.00	10.00 / 39.00	9.80 / 36.00
Filtrate CL (ppm)	1,400.00	1,000.00	1,100.00	2,400.00
pH / Fluid Loss (mptm)	8.00 / 8.00	8.10 / 8.70	8.20 / 8.20	8.50 / 8.50
PV (cP) / YP (lhf2)	2 / 1.00	2 / 1.00	12 / 11.00	10 / 8.00
% Solids / % Sand	.25 / 0	1.6 / 0	8.4 / .25	8 / .1
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Max Tool Temp (degF) / Source	167.97 / PCM	167.97 / HCIM	165.58 / PCM	250.82 / HCIM
Rm @ Max Tool Temp (degF)	N/A @ 167.97	N/A @ 167.97	N/A @ 165.58	N/A @ 250.82
Lead MWD Engineer	Ryan White	Ryan White	Ryan White	Ryan White
Customer Representative	Levi Hancock	Levi Hancock	Levi Hancock	Levi Hancock

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	HCIM	
Software Version	5.76	5.76	5.76	88.47	
Sub Serial Number	11341350	11341350	11341350	11512741	
Insert Serial Number	11620299	11620299	11400833	10951820	
Date and Time Initialized	23-Dec-12 15:48	01-Jan-70 00:00	30-Dec-12 04:36	02-Jan-13 02:06	
Date and Time Read	30-Dec-12 17:37	30-Dec-12 17:43	31-Dec-12 21:38	05-Jan-13 05:16	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	47.35	47.35	47.55	42.10	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	11341350	11341350	11341350	10743045	
Sonde Serial Number	11638601	11638601	11145688	11145688	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	173.83	179.20	293.77	254.58	

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG	DGR	
Distance From Bit (ft)	52.30	52.30	52.50	63.64	
Recorded Sample Period (sec)	10	10	10	8	
Software Version	8.15	8.15	8.15	N/A	
Sub Serial Number	11341350	11341350	11341350	11512741	
Insert/Sonde Serial Number	11292593	11292593	11681051	10449262	

Resistivity Sensor Information

Tool Type				Slim P4	
Distance From Bit (ft)				56.68	
Recorded Sample Period (sec)				6	
Software Version				5.55	
Sub Serial Number				11233610	
Receiver Insert Serial Number				109250	
Transmitter Insert Serial Number				247851	
Receiver Orientation				Down	

Pulser Controller Sensor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.76	5.76	5.76	8.04	
PIC Software Version	1.40	1.40	1.40	N/A	
Sub/HOC Serial Number	11341350	11341350	11341350	10507567	
Insert/Probe/Module SN	11620299	11620299	11400833	11400833	
Battery Serial Number	N/A	N/A	N/A	N/A	
Valve Insert SN	N/A	N/A	N/A	N/A	
DC Insert Serial Number	N/A	N/A	N/A	N/A	
Choke Size (32nd)	N/A	N/A	N/A	N/A	
Driver Current (amps)	N/A	N/A	N/A	N/A	
Driver SMI Current (amps)	N/A	N/A	N/A	N/A	
Boot Strap Version	4,130.00	4,130.00	4,130.00	N/A	

DDSr-DGR Sensor Information

Tool Type				DDSr-DGR	
Distance From Bit (ft)				66.58	
Recorded Sample Period (sec)				12	
Software Version				10.72	

Sub Serial Number				11512741	
Insert Serial Number				11032885	
Sensor ID Number				5608	

REMARKS

1. All depths are referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.

2. No depth corrections have been made for pipe stretch or compression.

3. All data presented is recorded data unless otherwise specified

4. The following smoothing parameters have been applied to the data:

Slim-Phase 4 (Electromagnetic Wave Resistivity):
Interval Resolution: 0.5ft
Interval Distance: 0.6ft
Gap Fill: 3.0ft

DGR (Corrected Gamma Ray):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft

ROPA (Average Rate of Penetration):
Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft
Gap Fill : 3.0 ft

5. INSITE version 7.4.1

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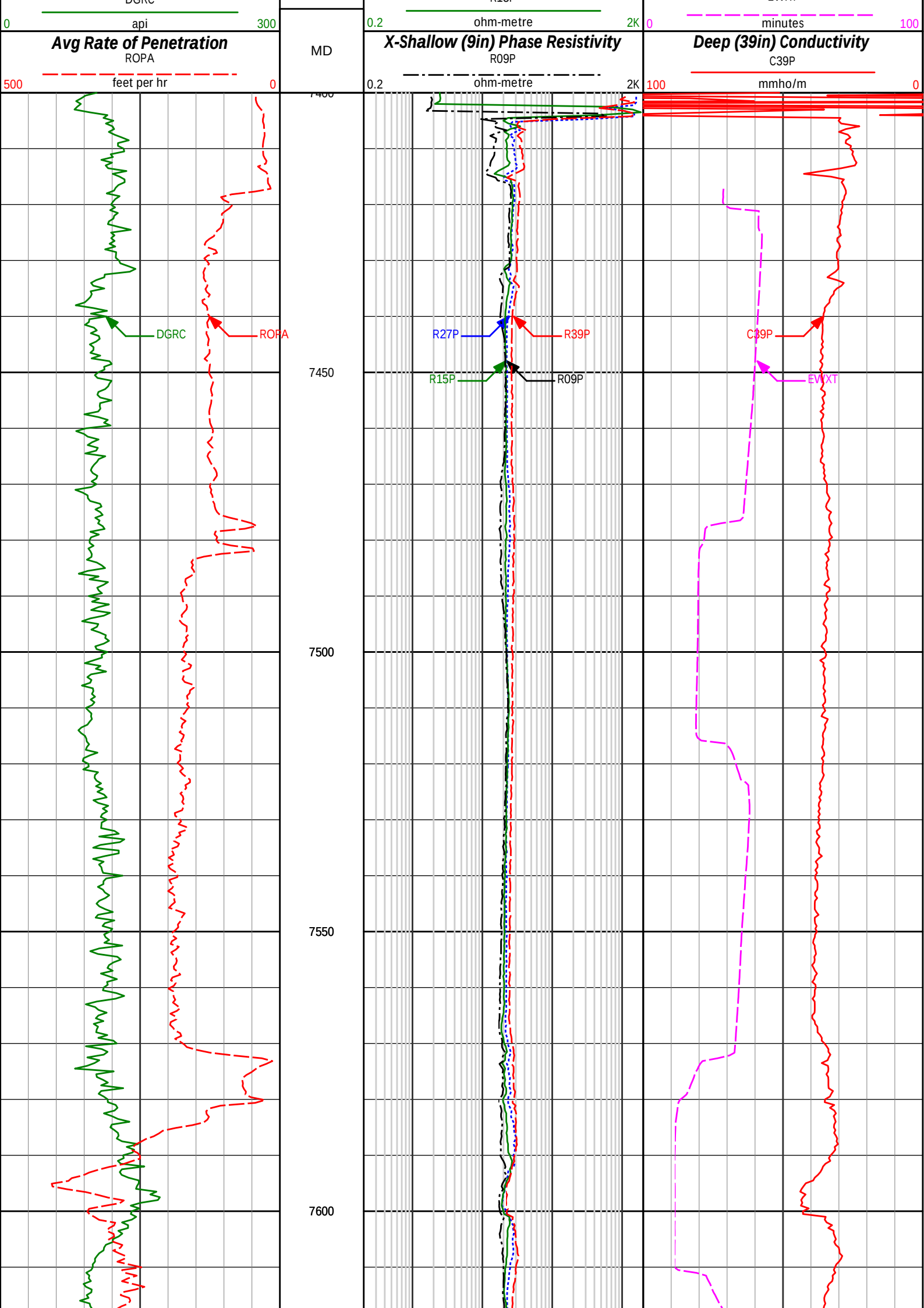
HALLIBURTON

Sperry Drilling Services

MD Detail Log 1:240

	Deep (39in) Phase Resistivity R39P 0.2 ohm-metre 2K	
	Medium (27in) Phase Resistivity R27P 0.2 ohm-metre 2K	
Gamma Ray Combined DGRC	**Shallow (15in) Phase Resistivity** R15P	**EWR Formation Exposure Time** EWXT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X-Shallow (9in) Phase Resistivity
R09P
0.2
ohm-metre
2K
0
minutes
100
Deep (39in) Conductivity
C39P
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mmho/m
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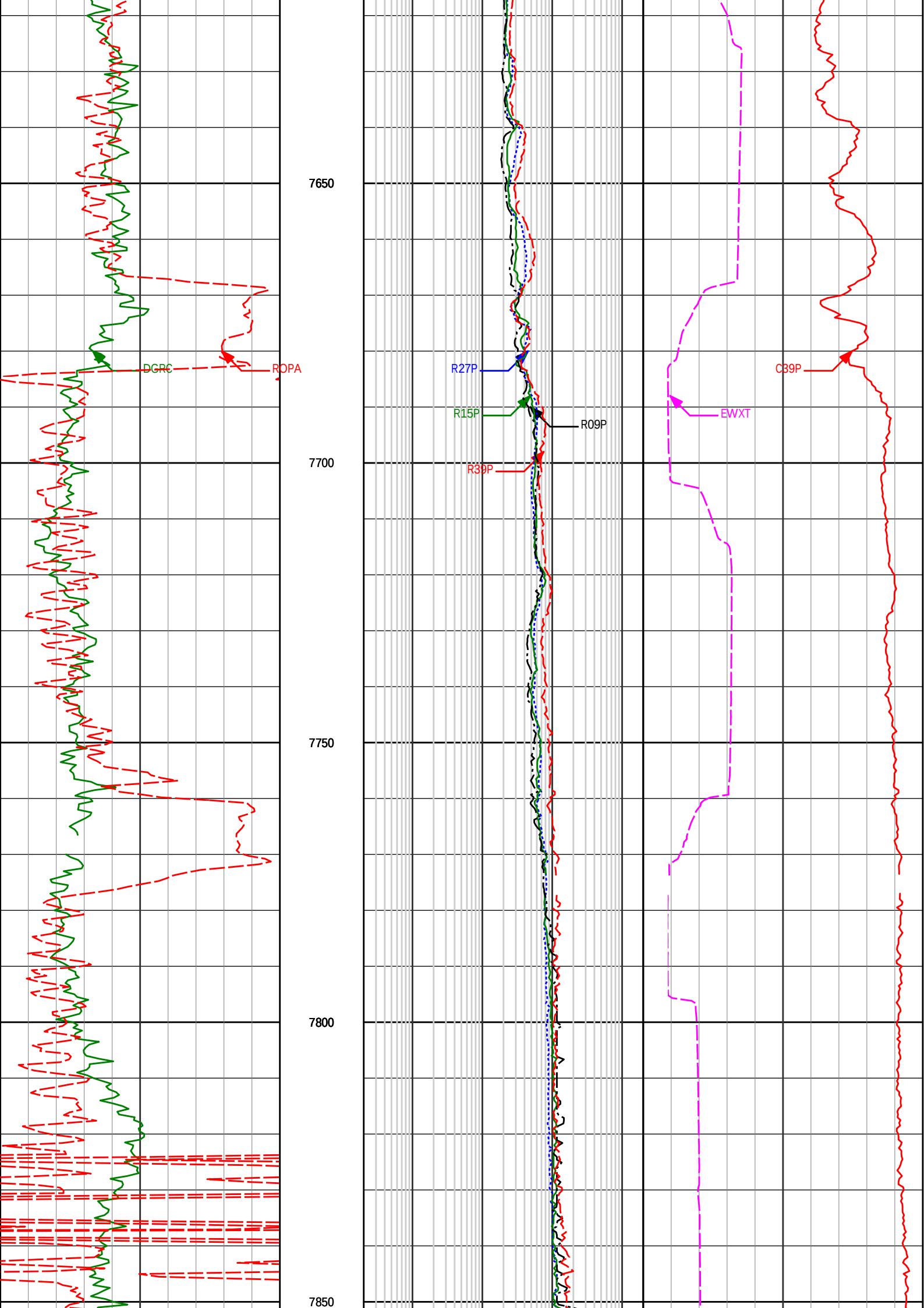
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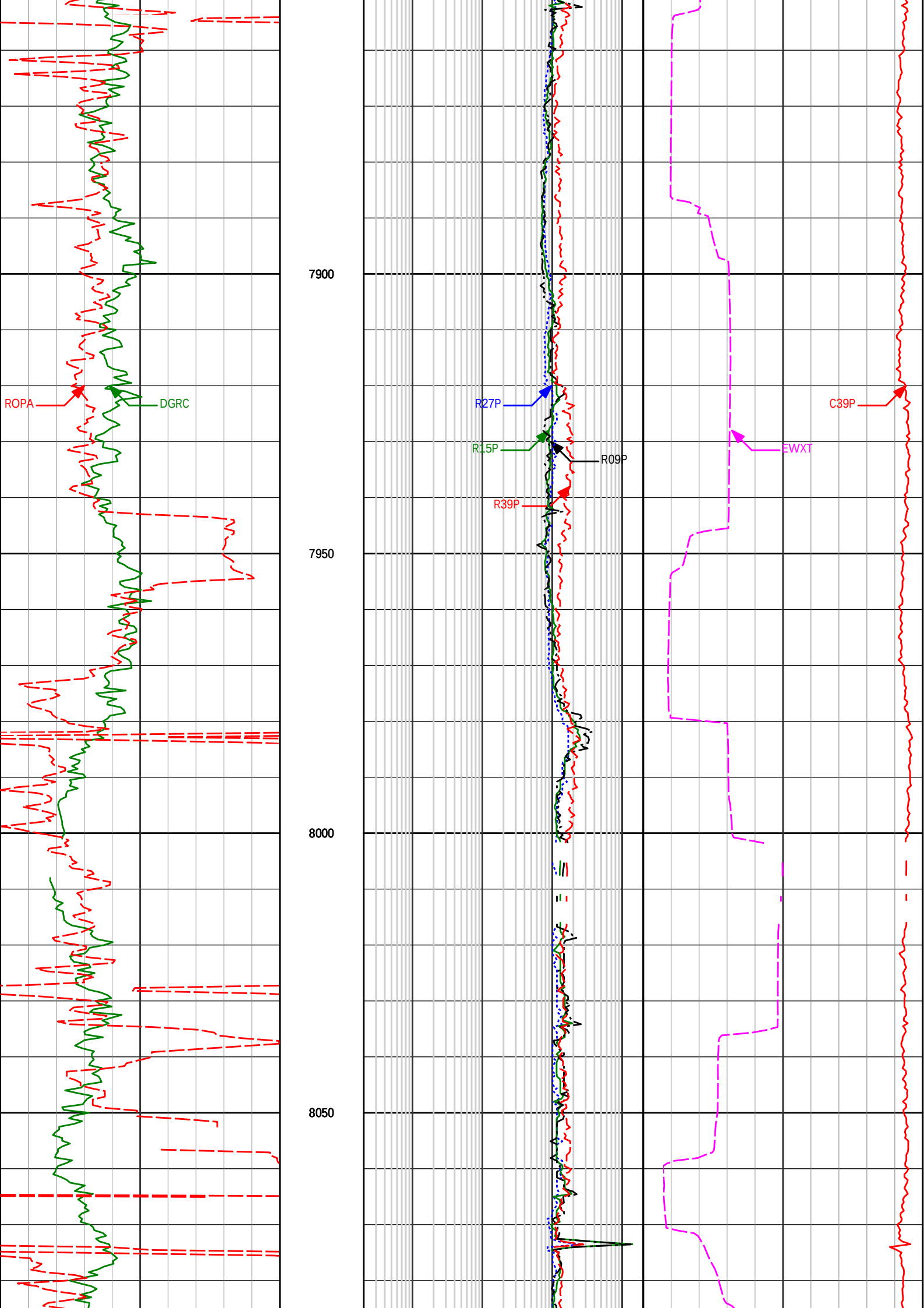
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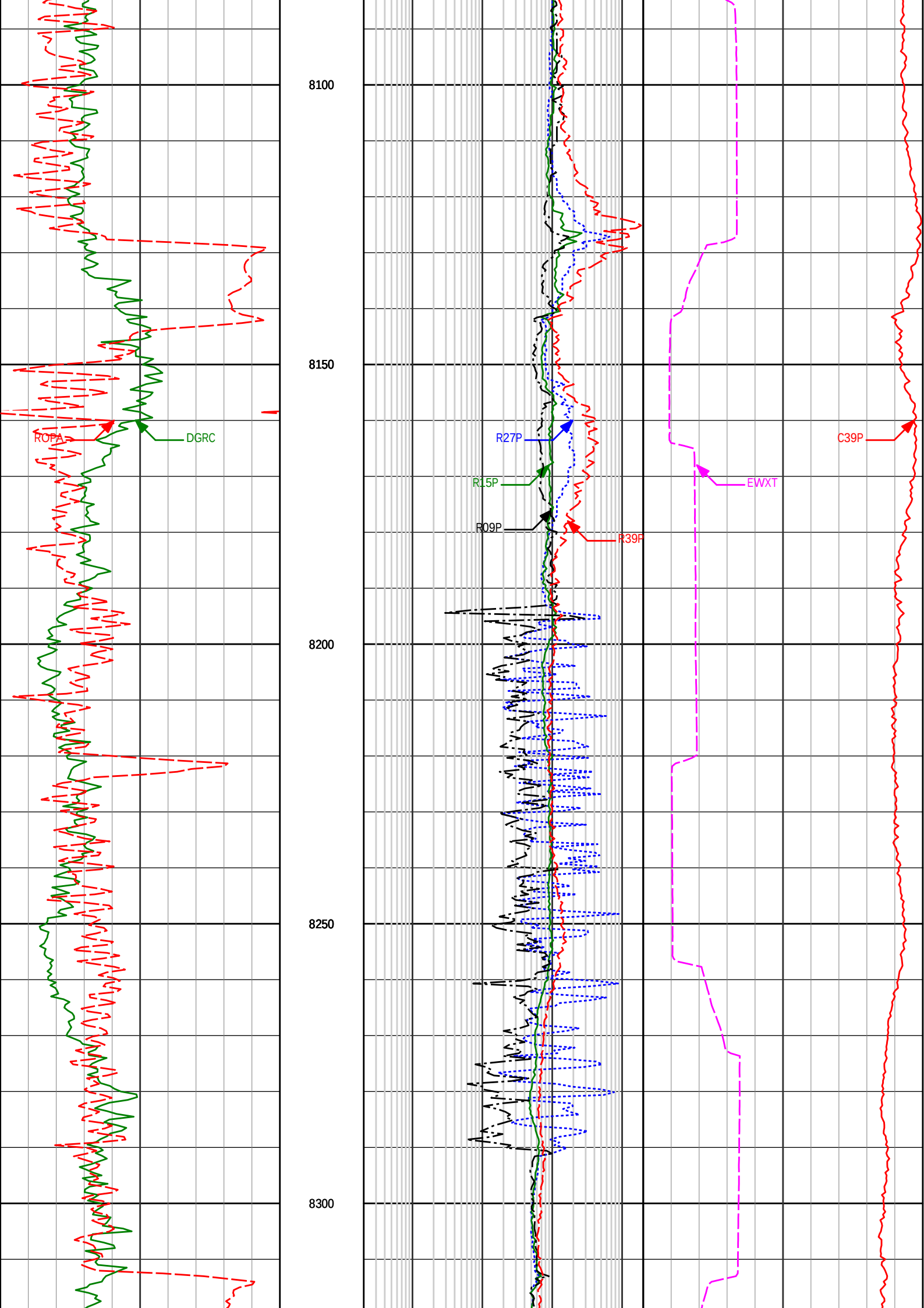
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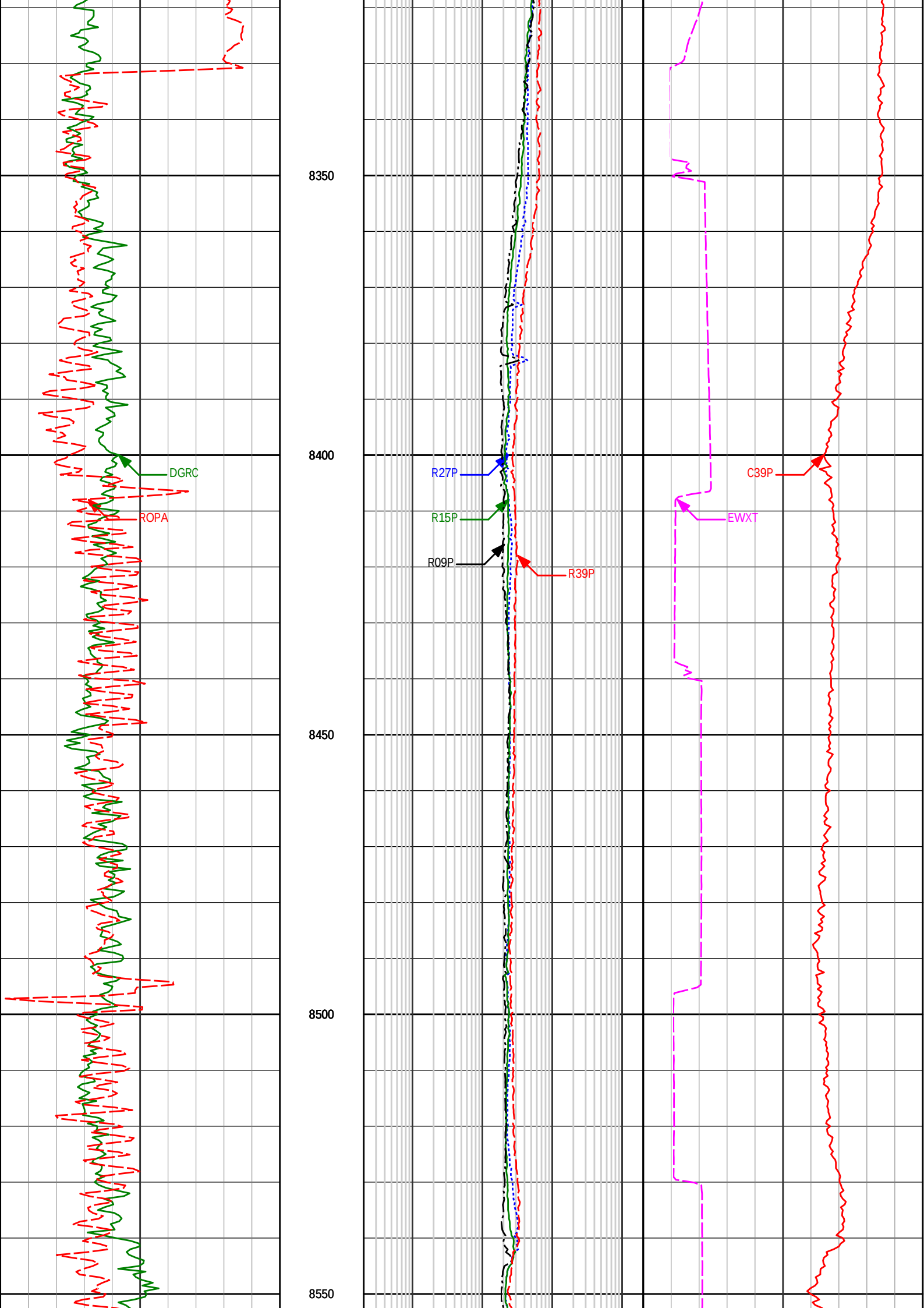
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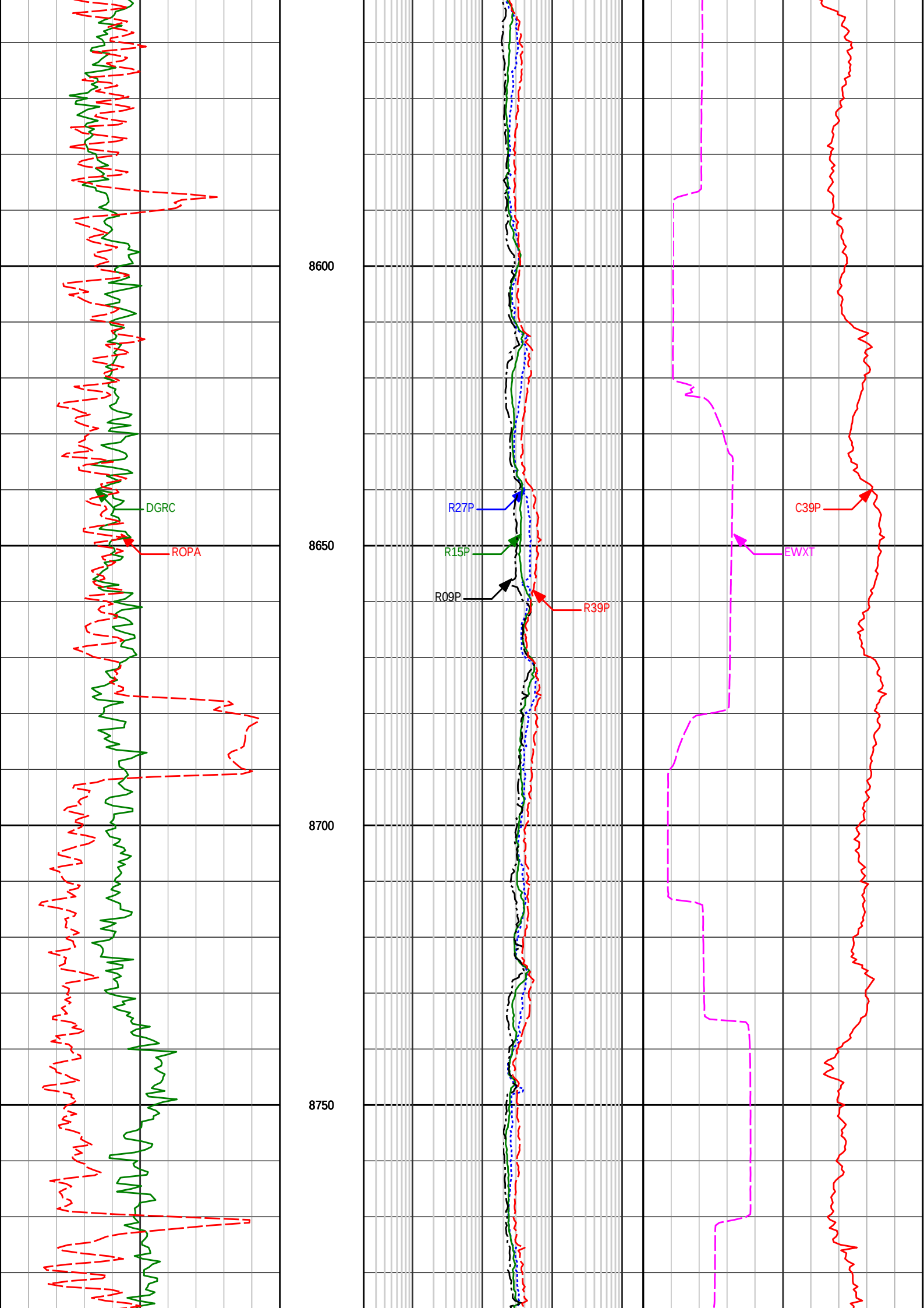
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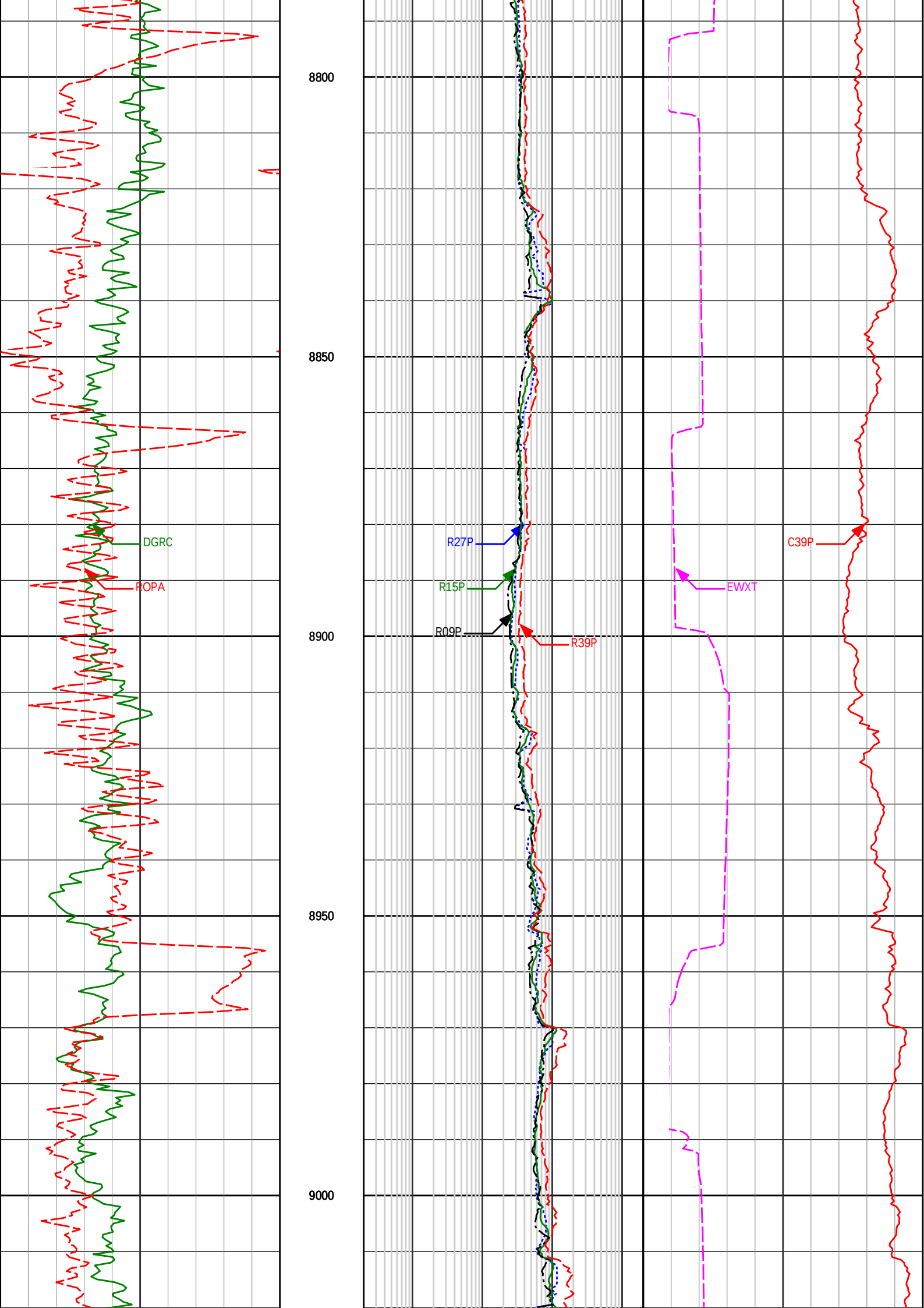
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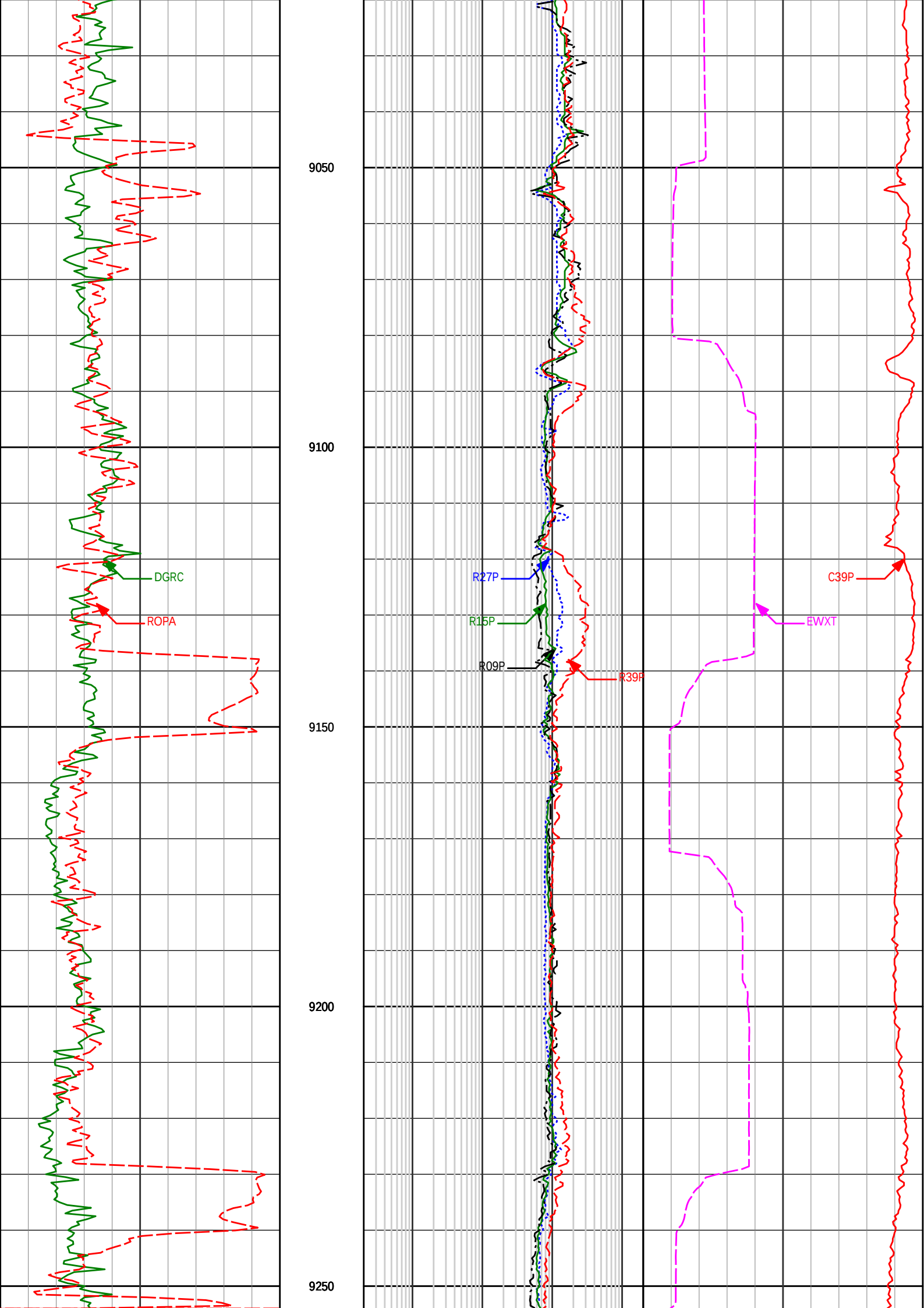
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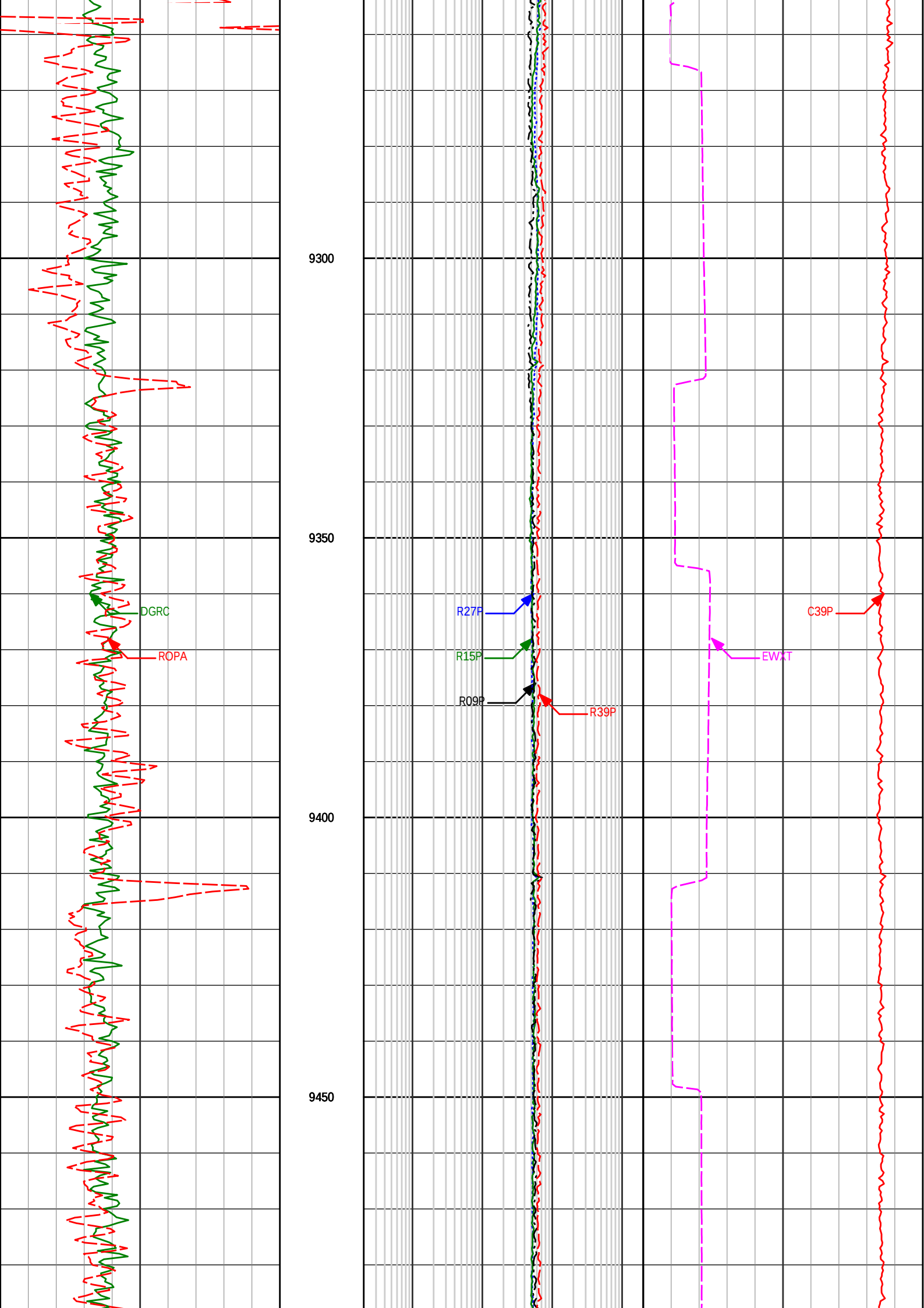
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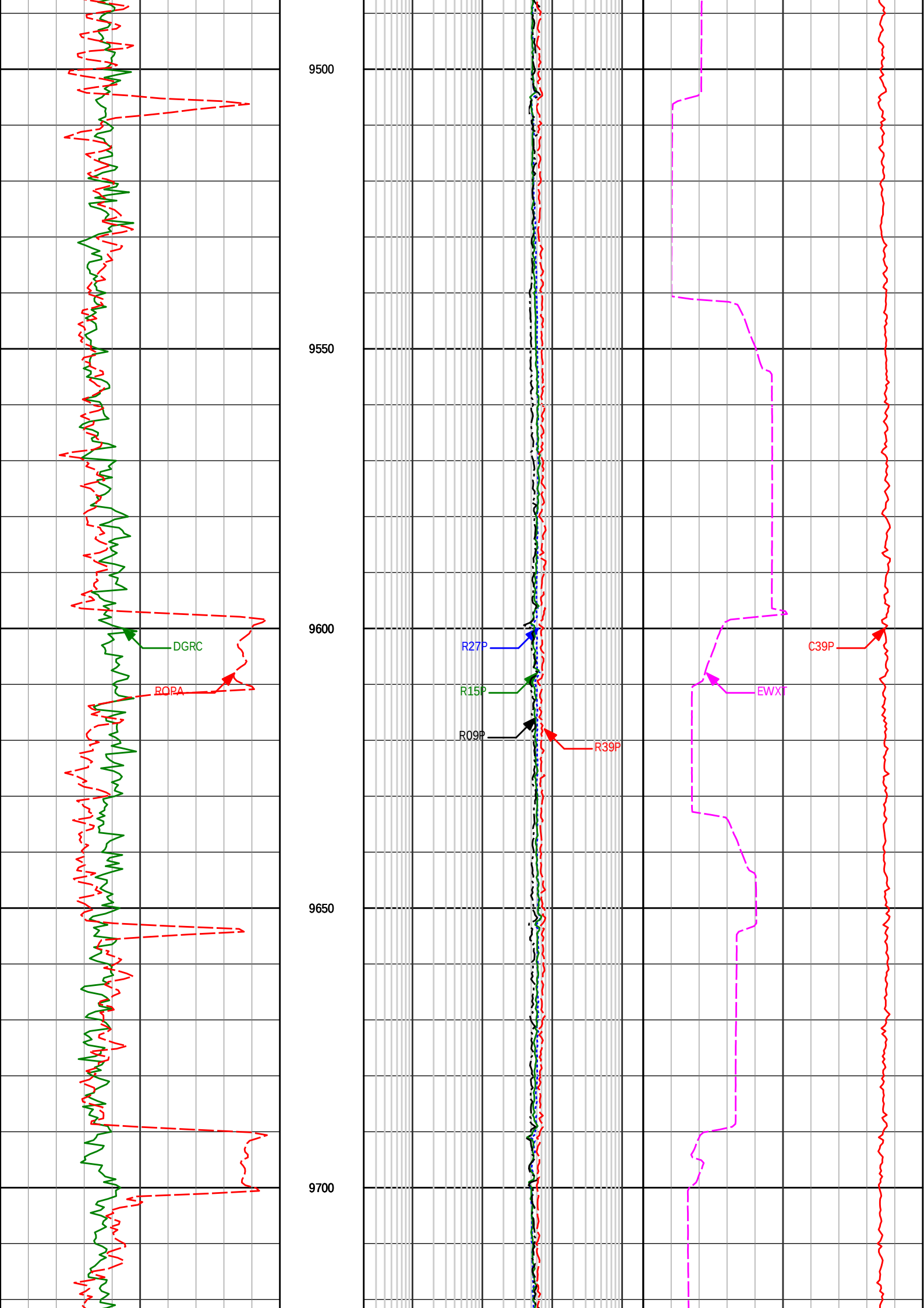
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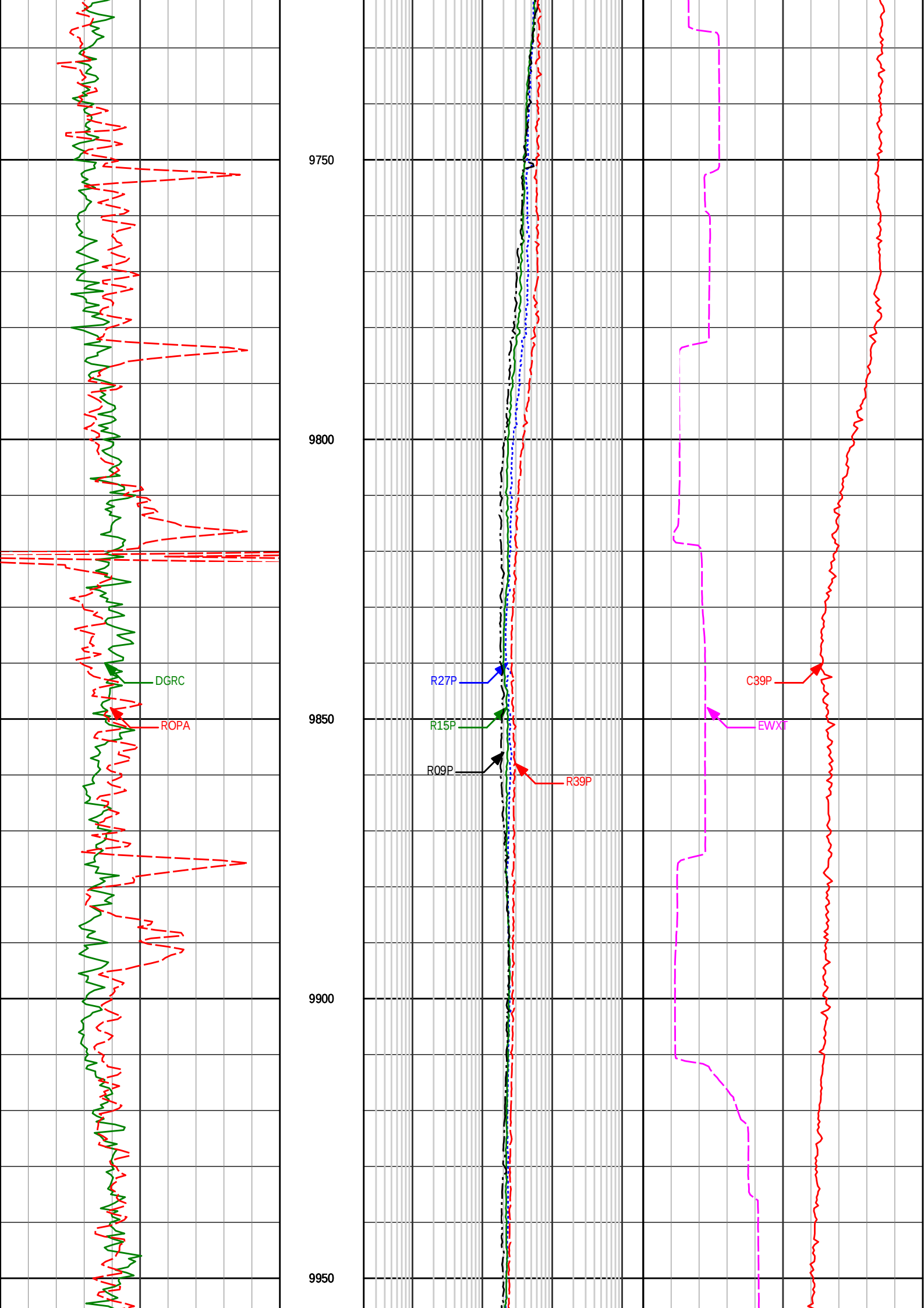
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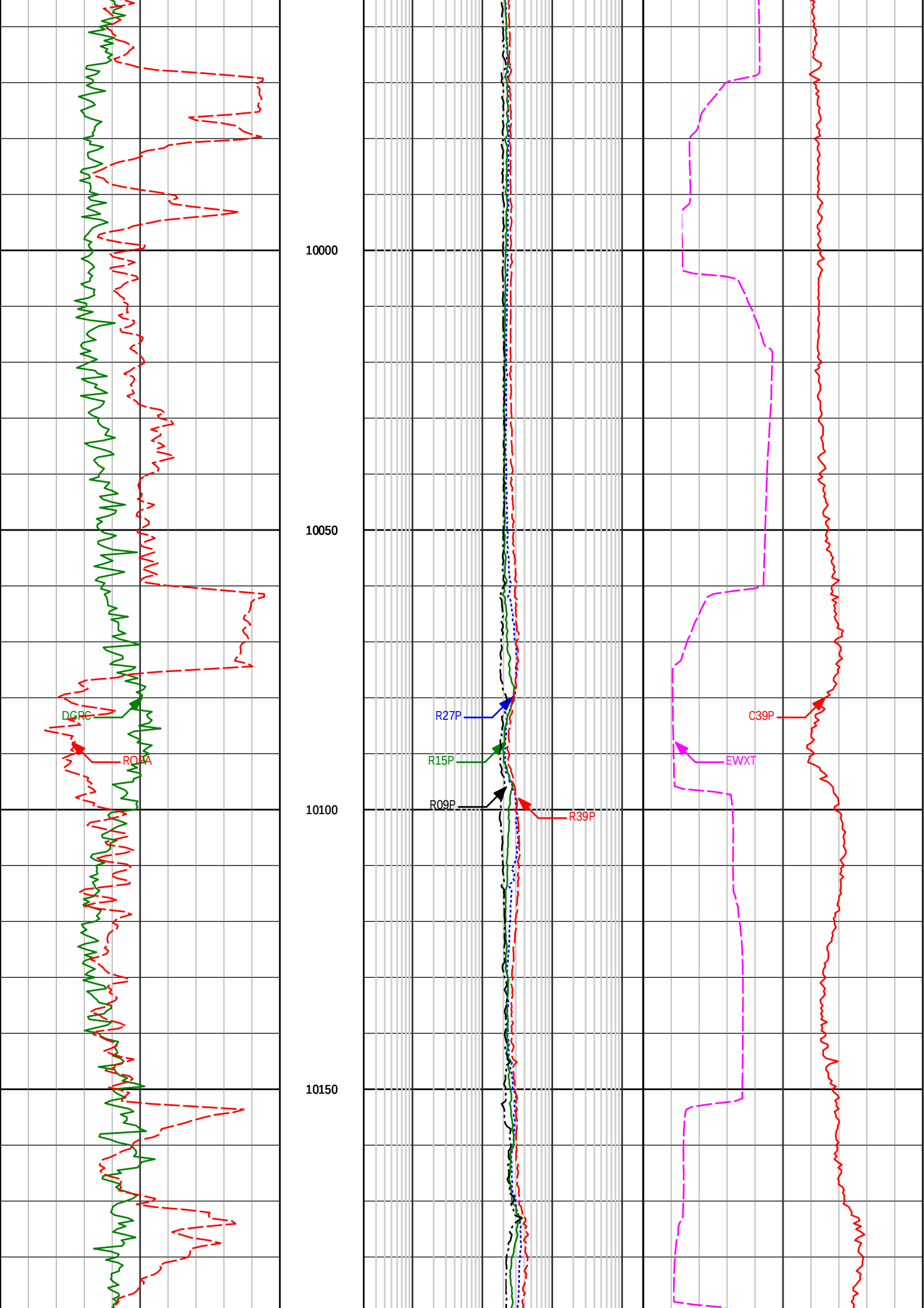
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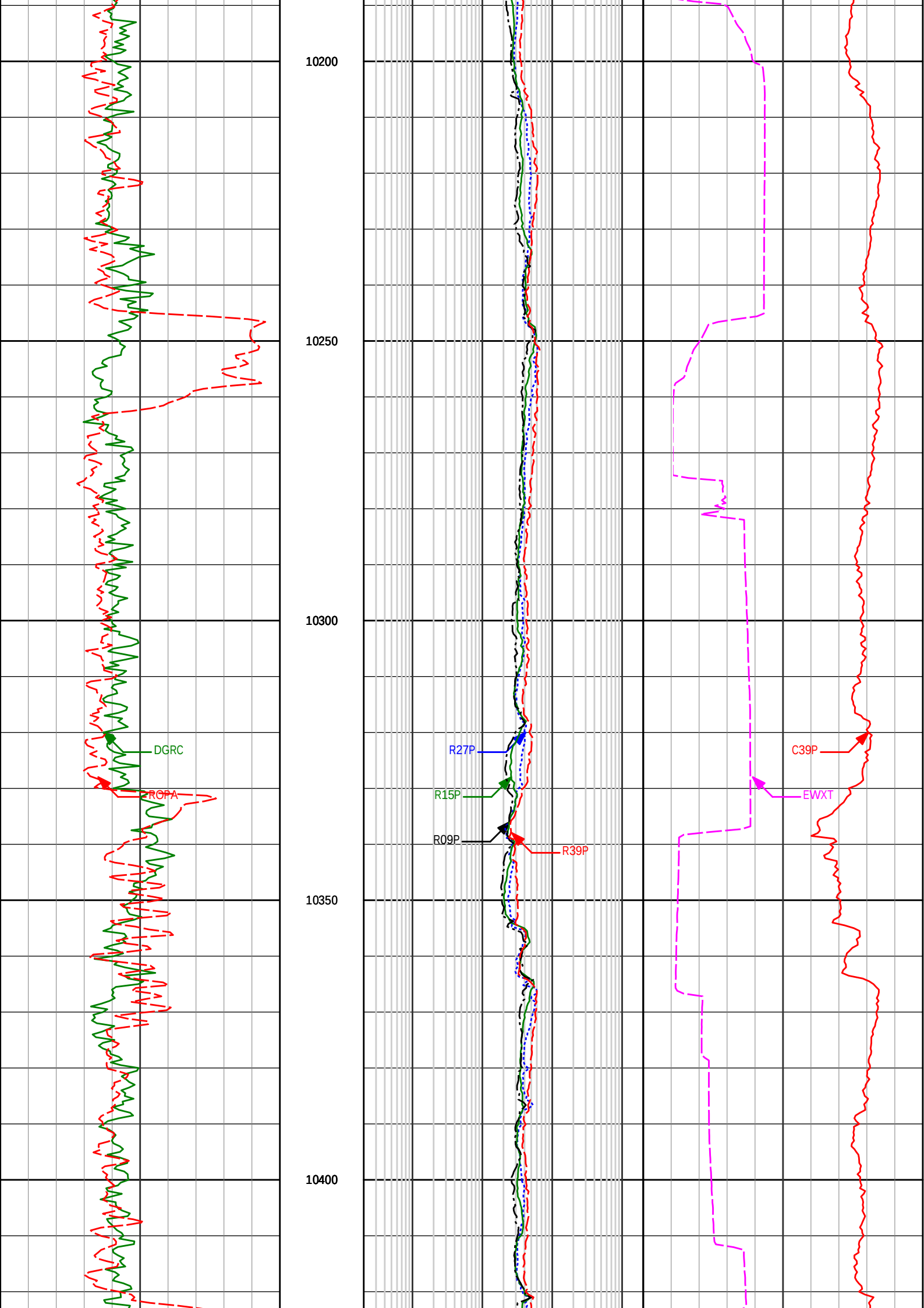
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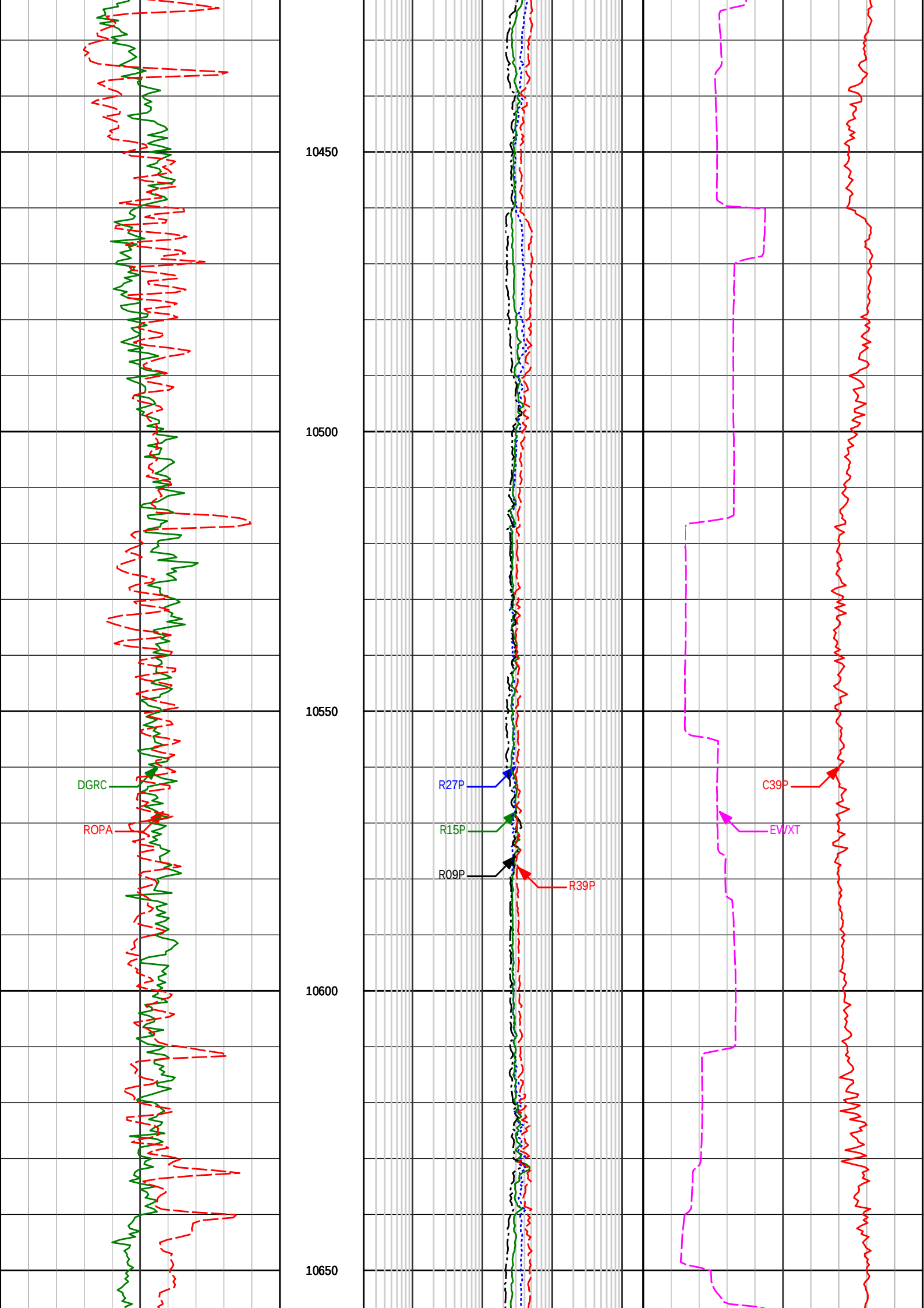
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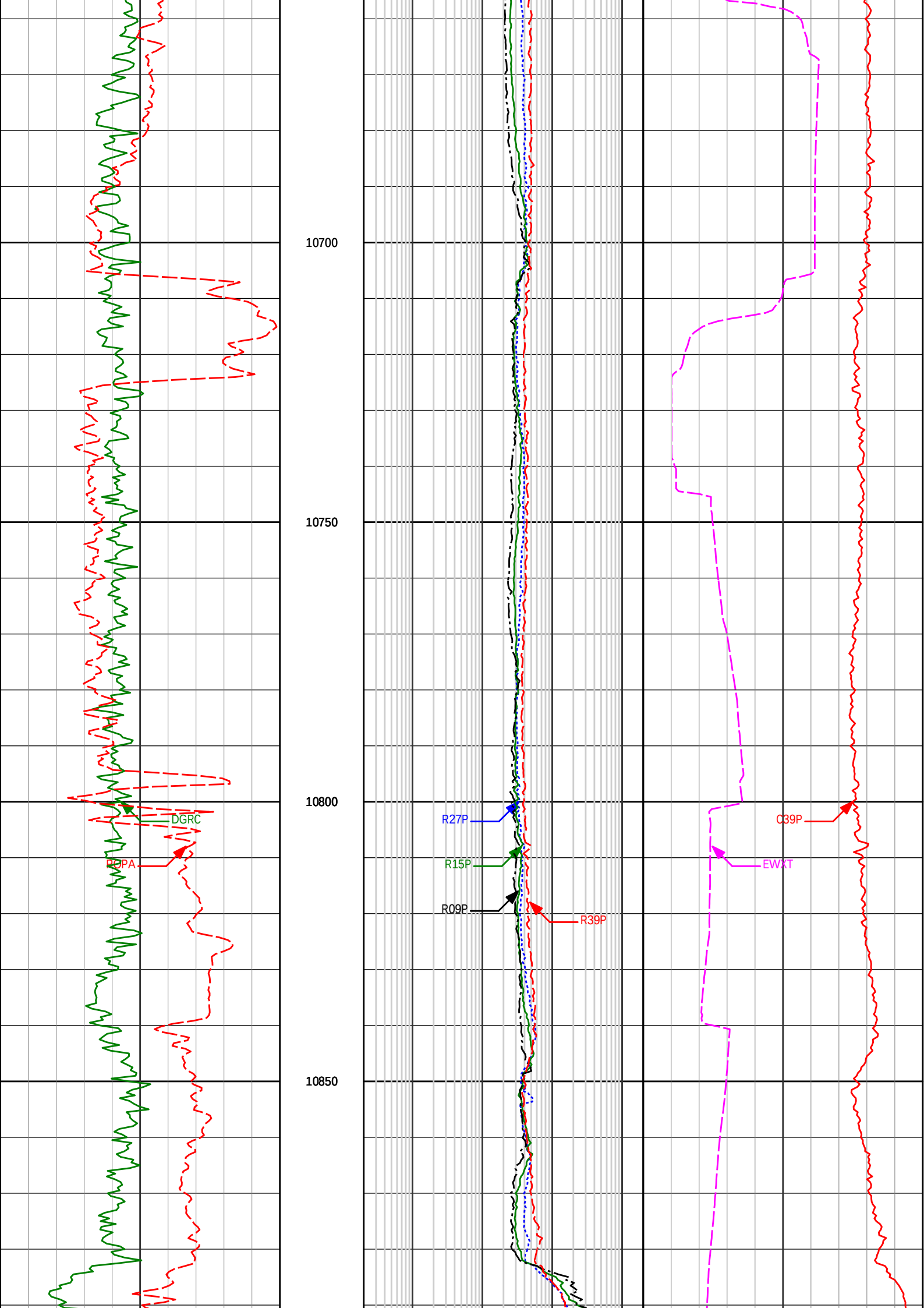
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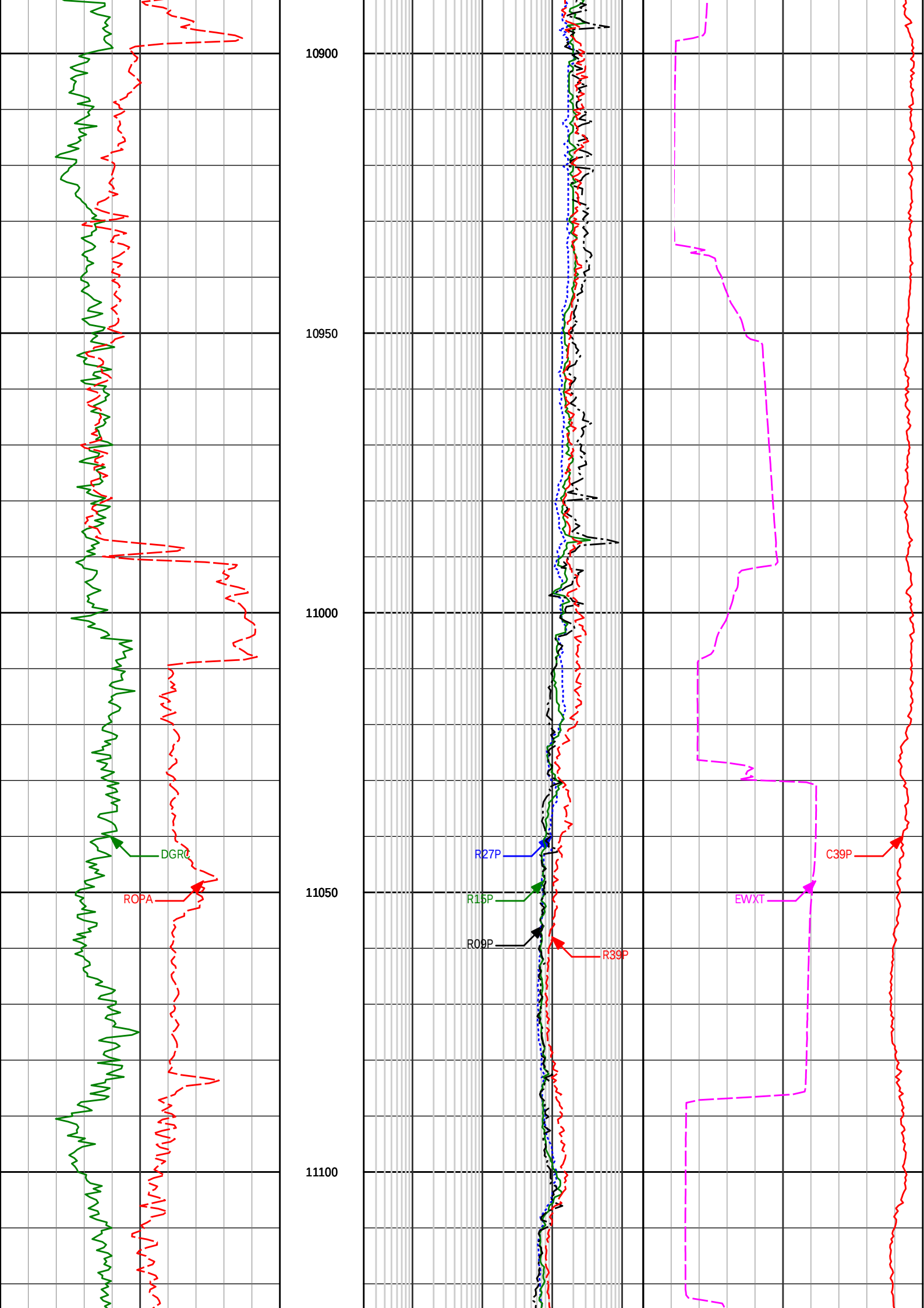
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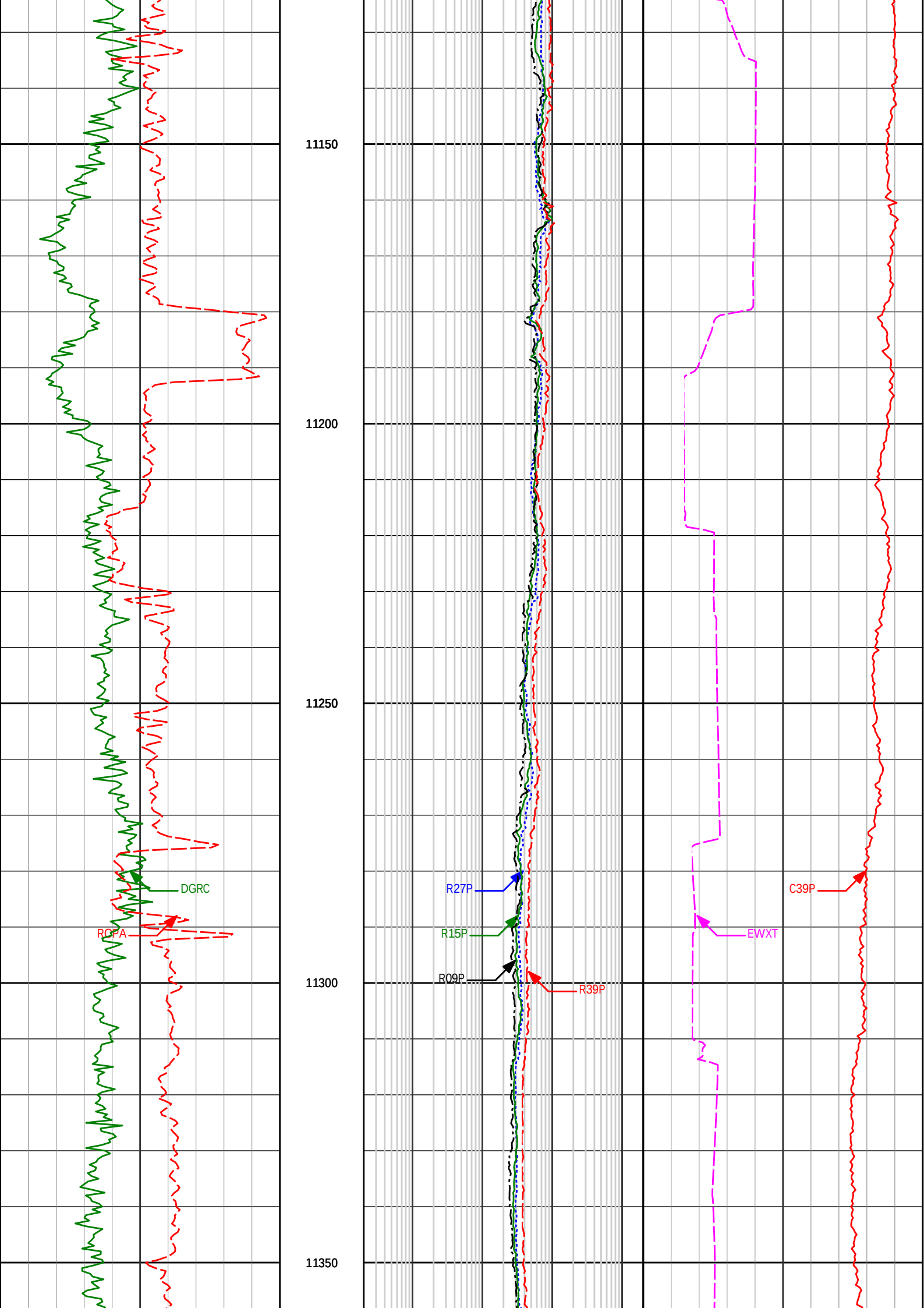
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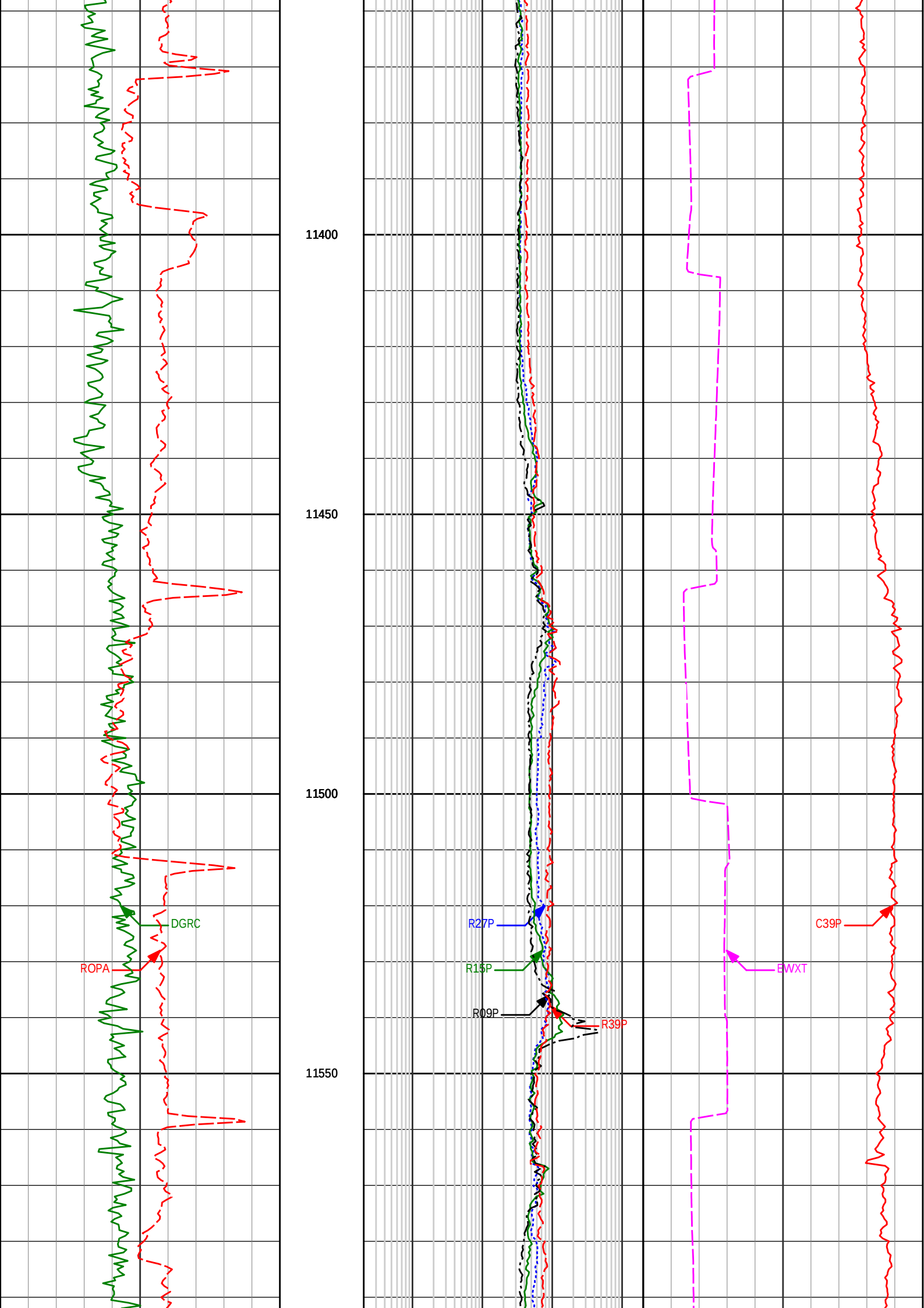
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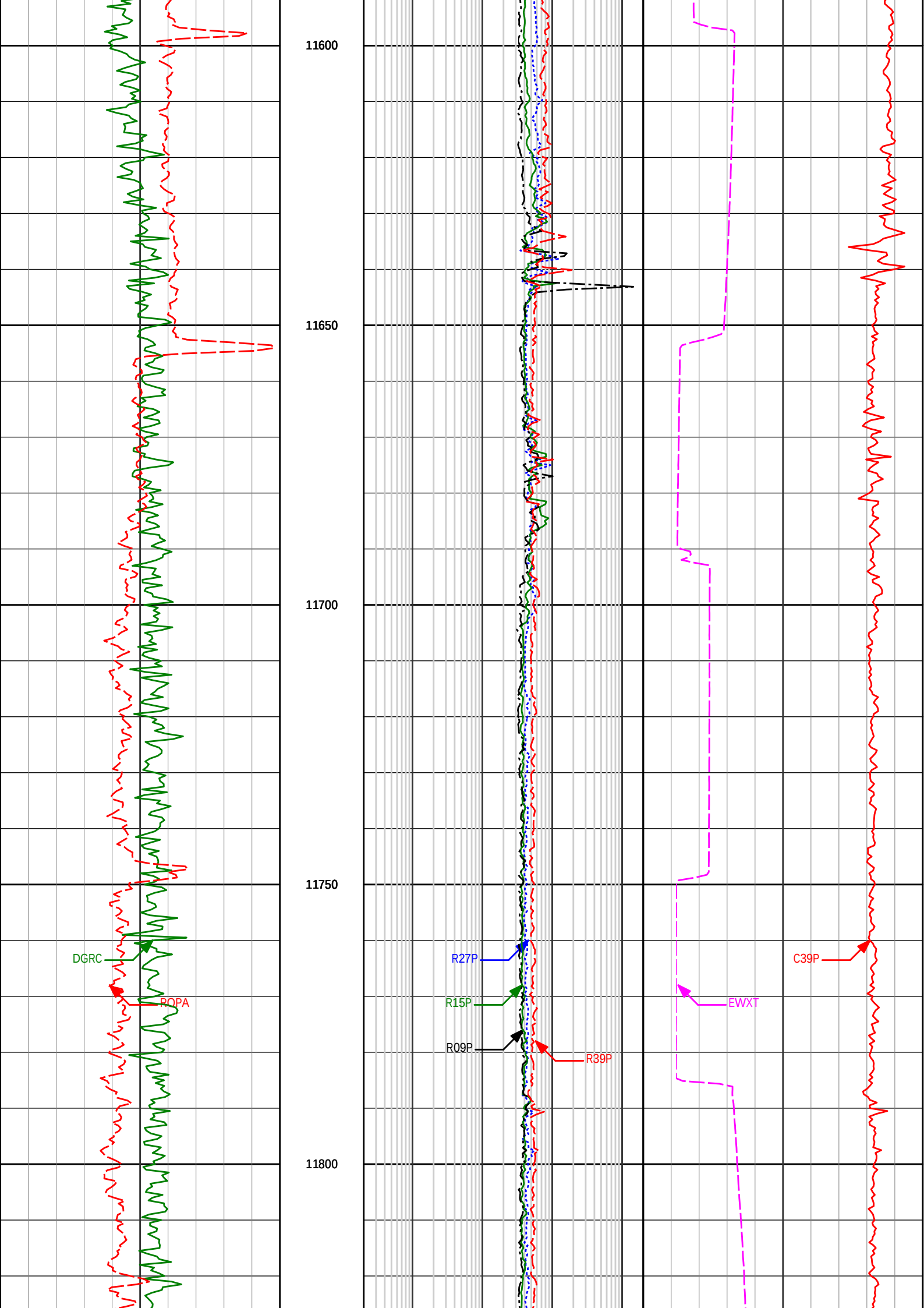
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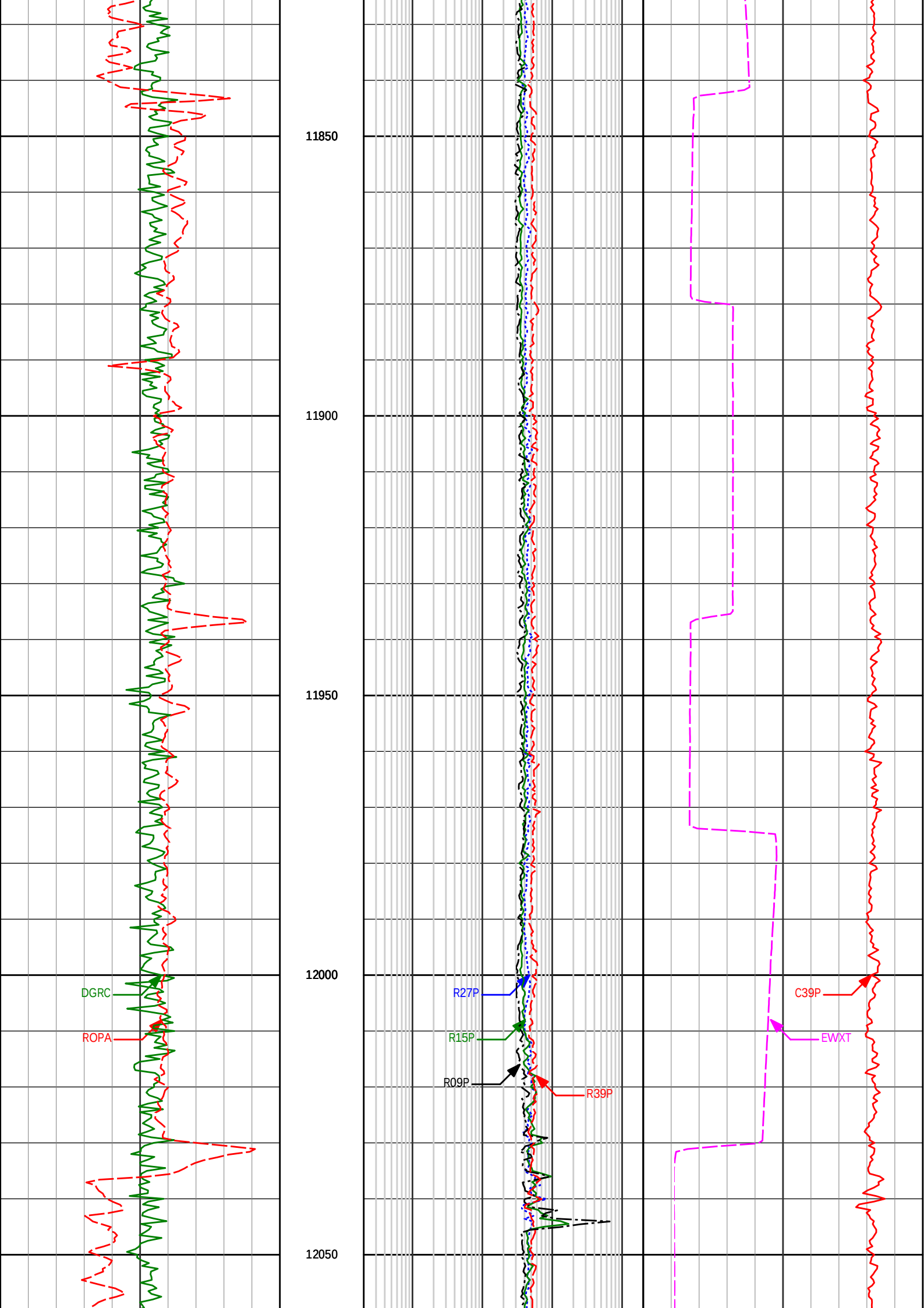
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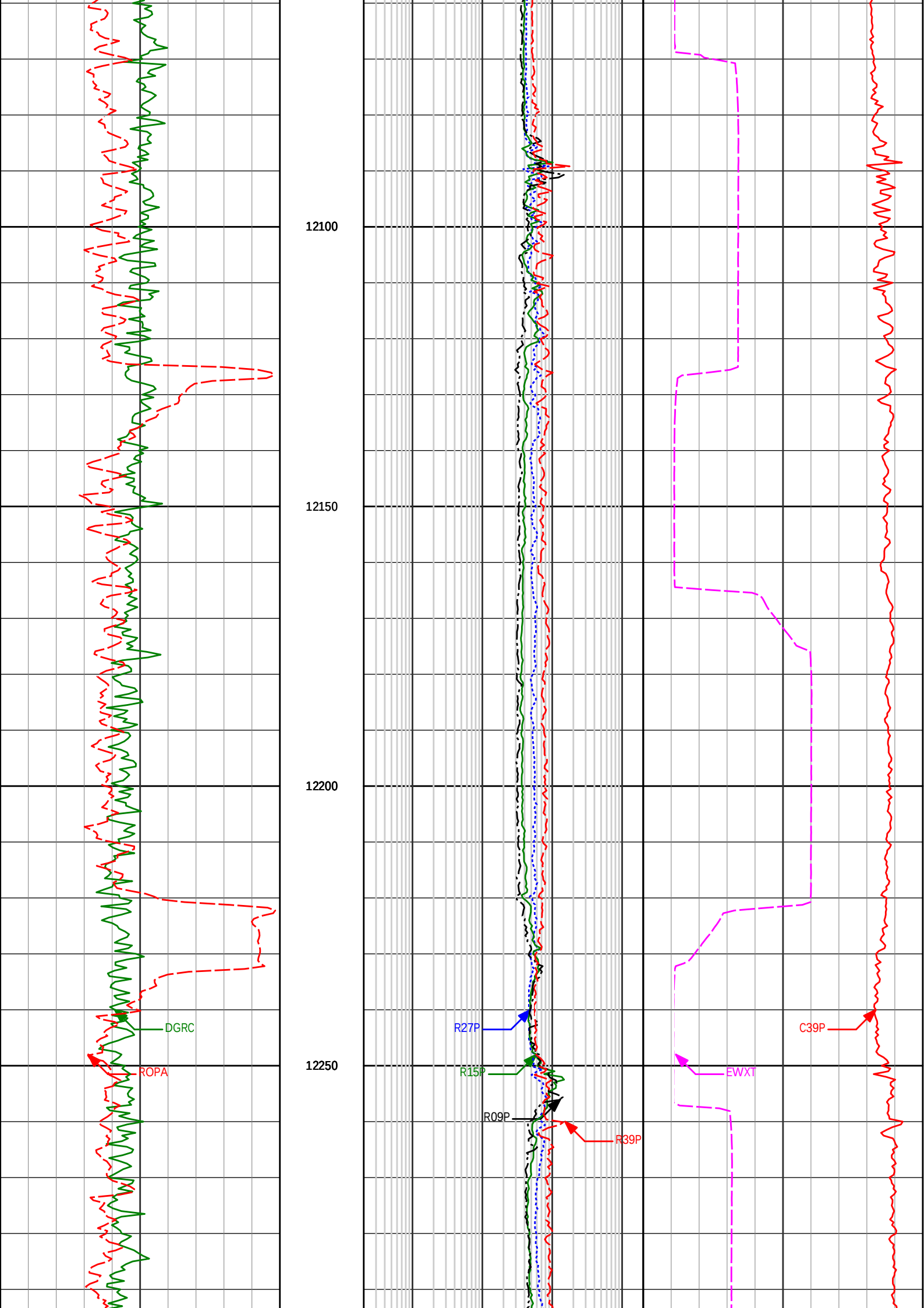
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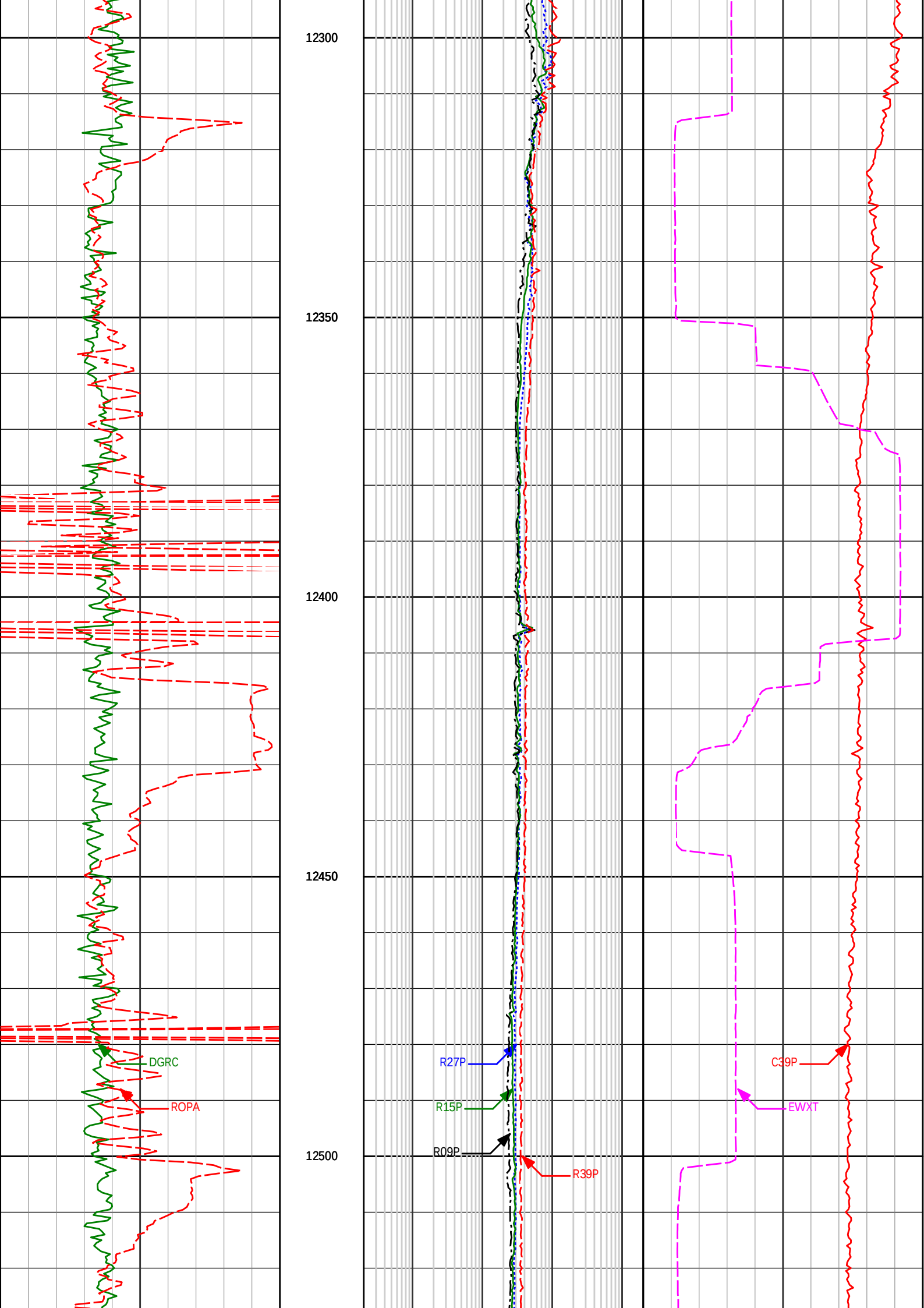
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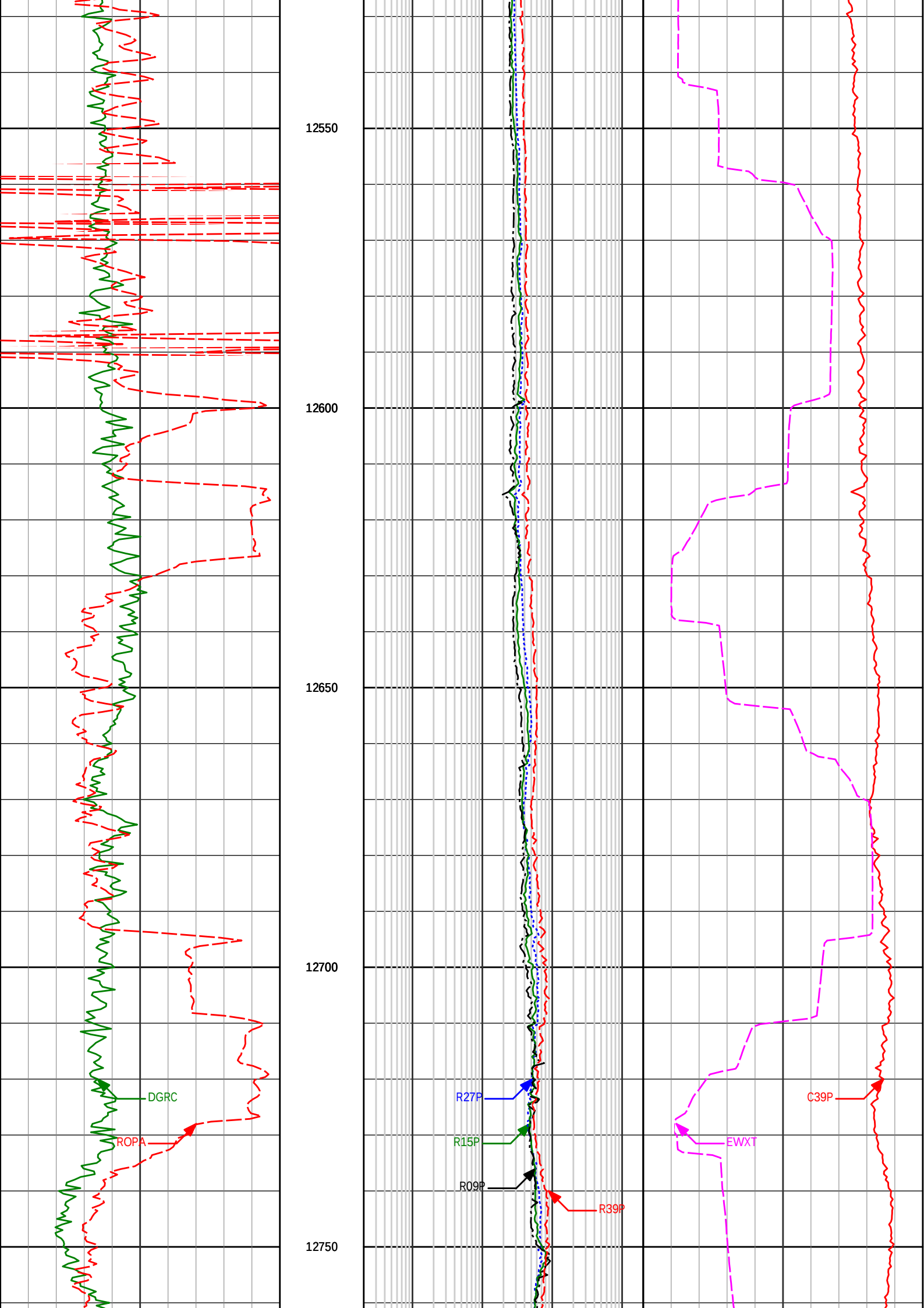
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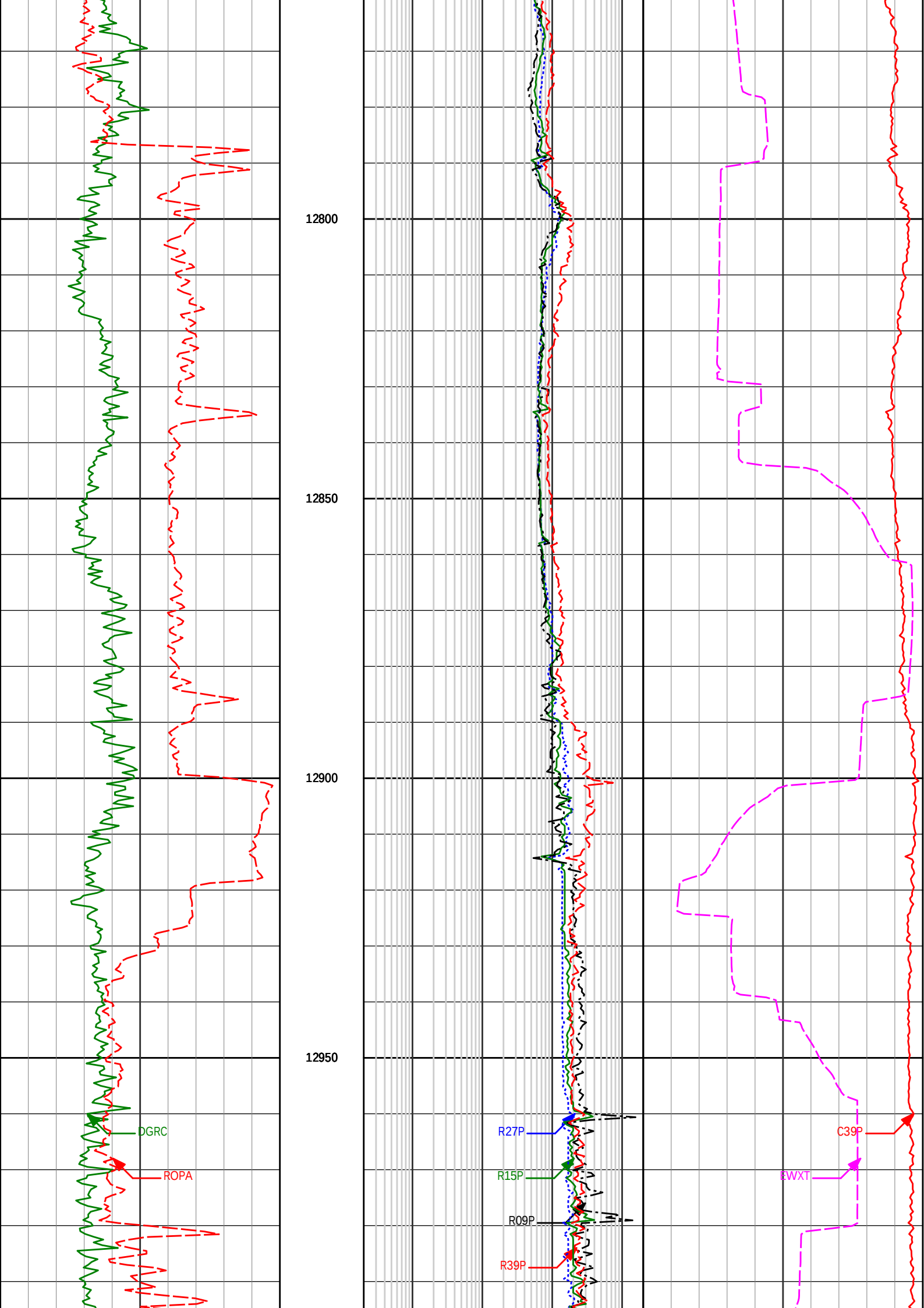
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12850
12900
12950
DGRC
ROPA
R27P
R15P
R09P
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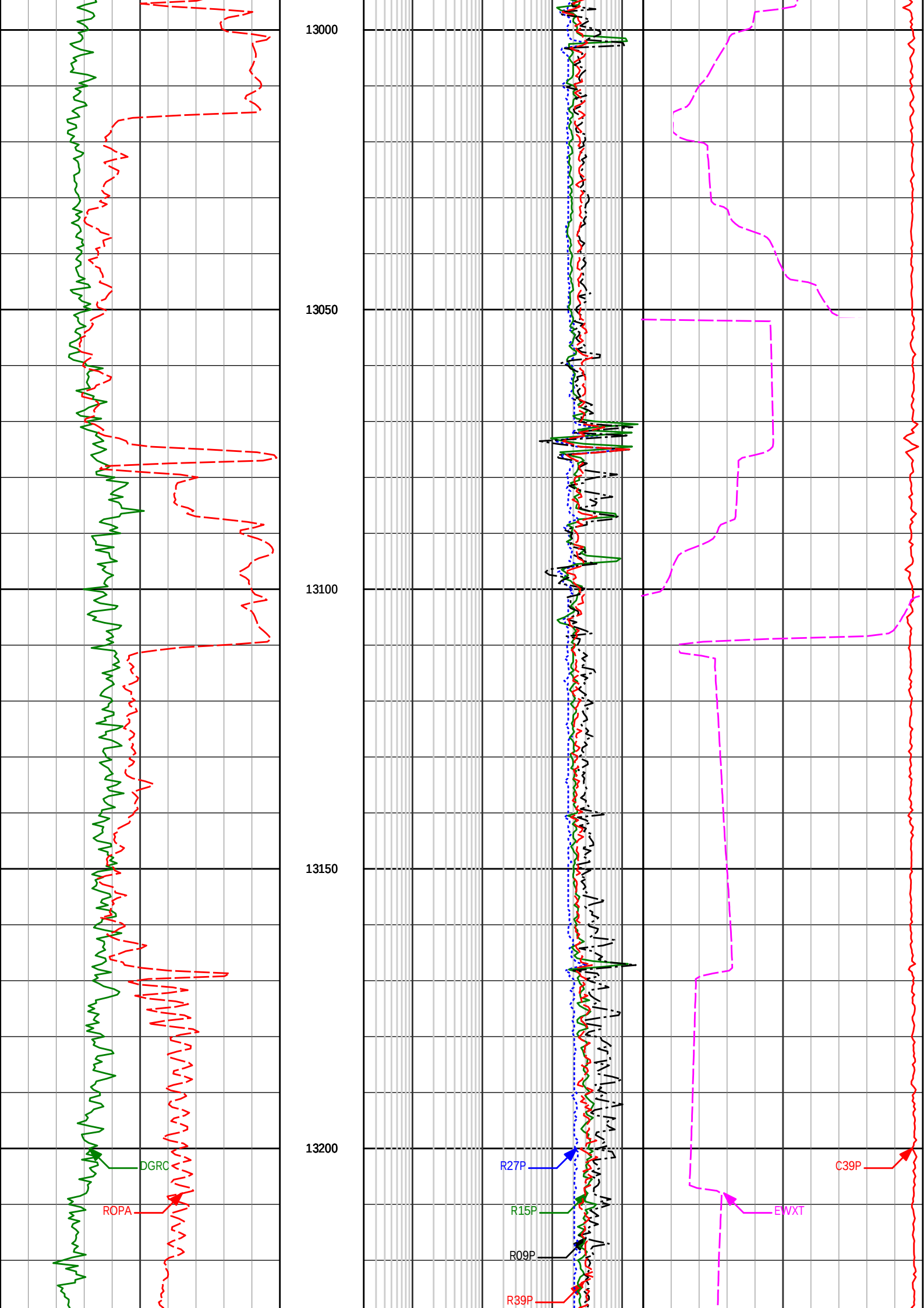
EWXT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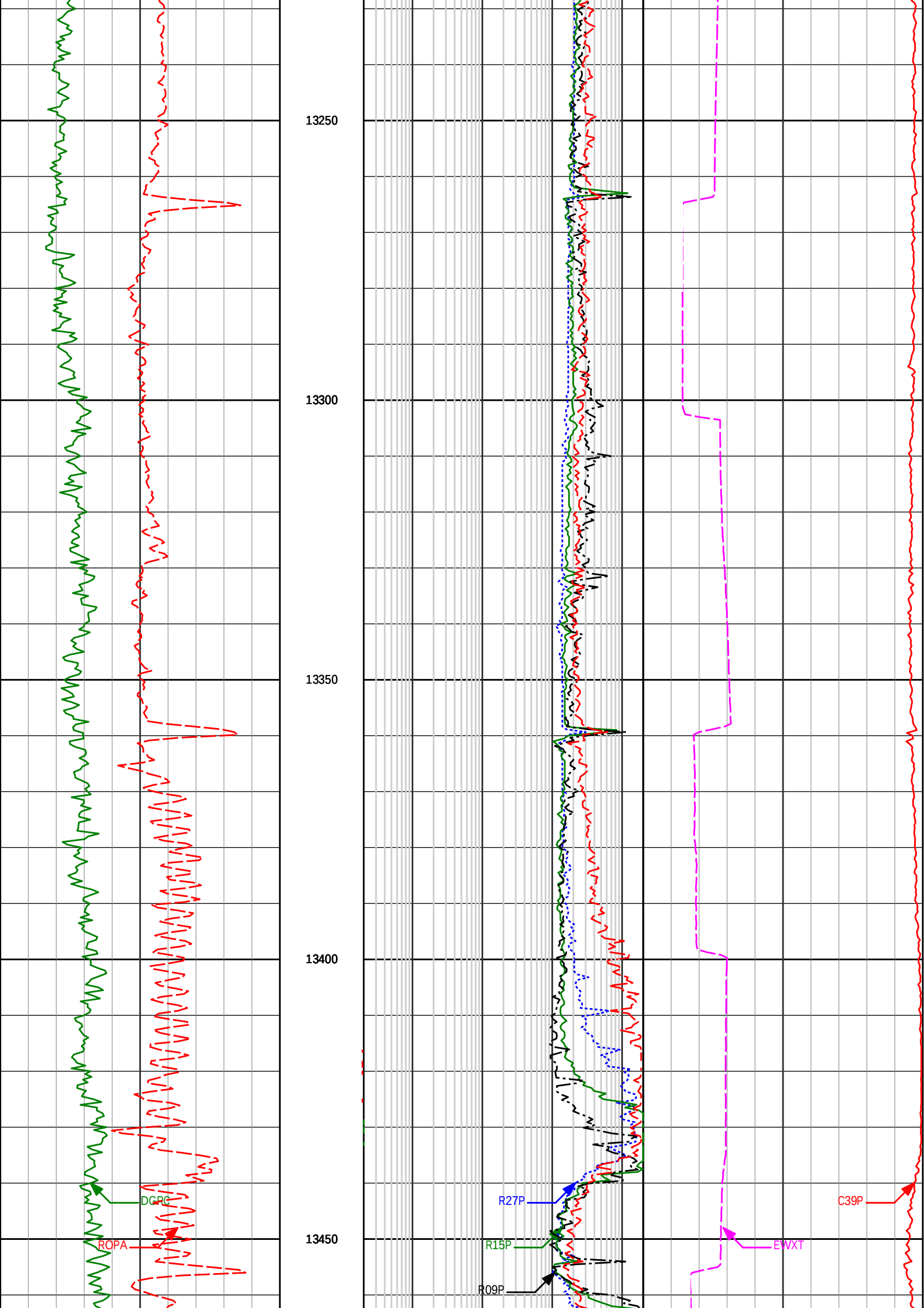
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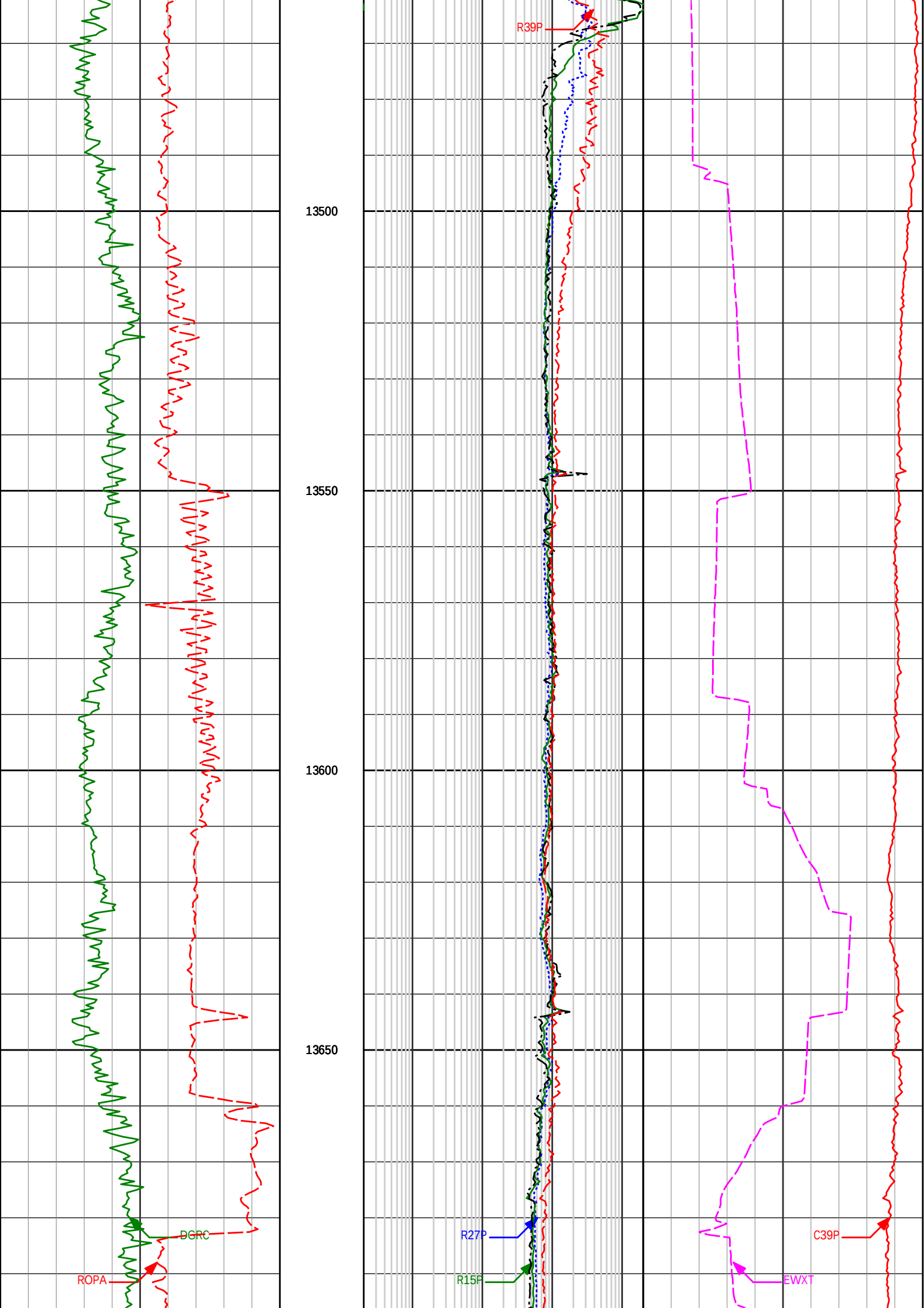
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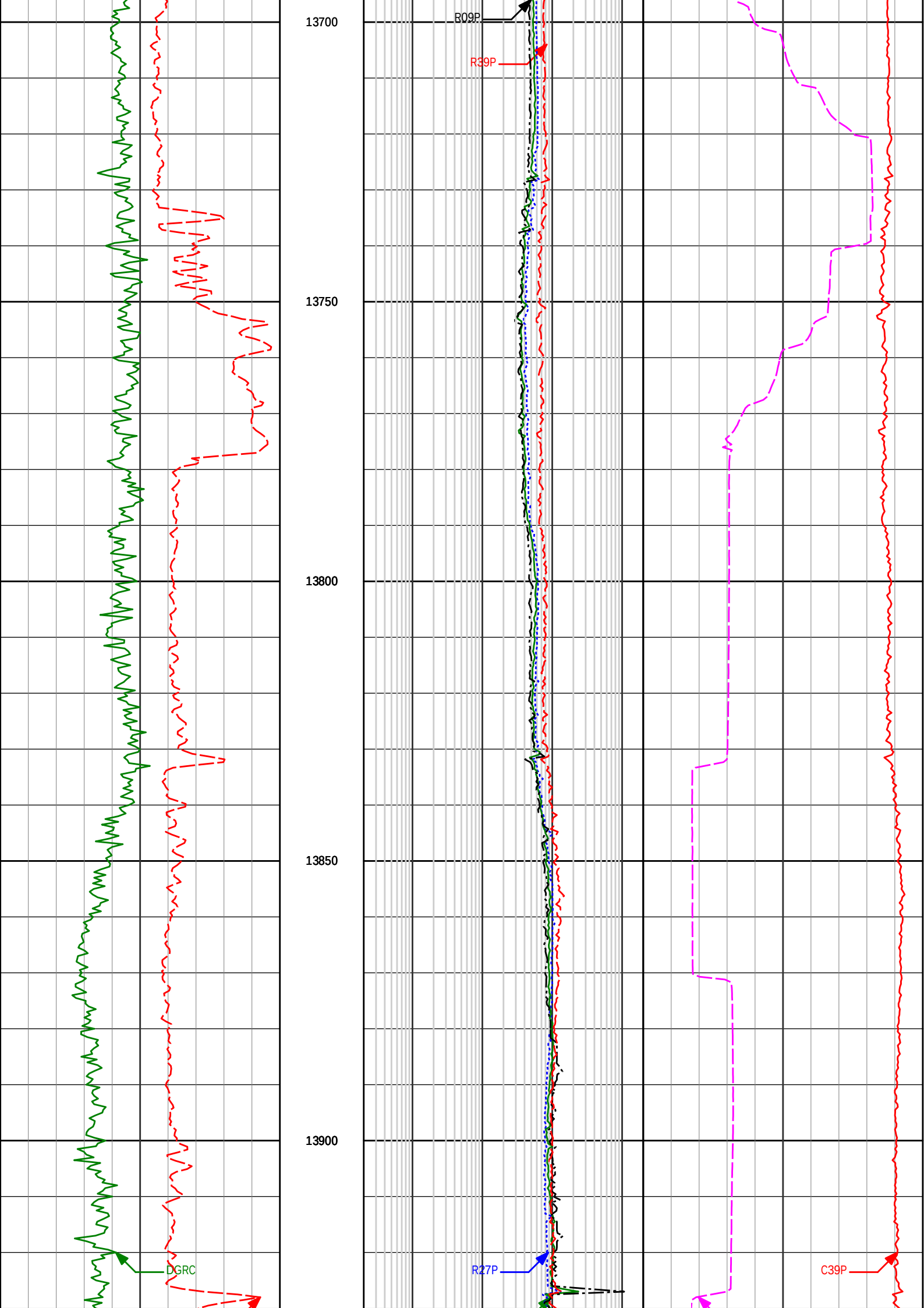
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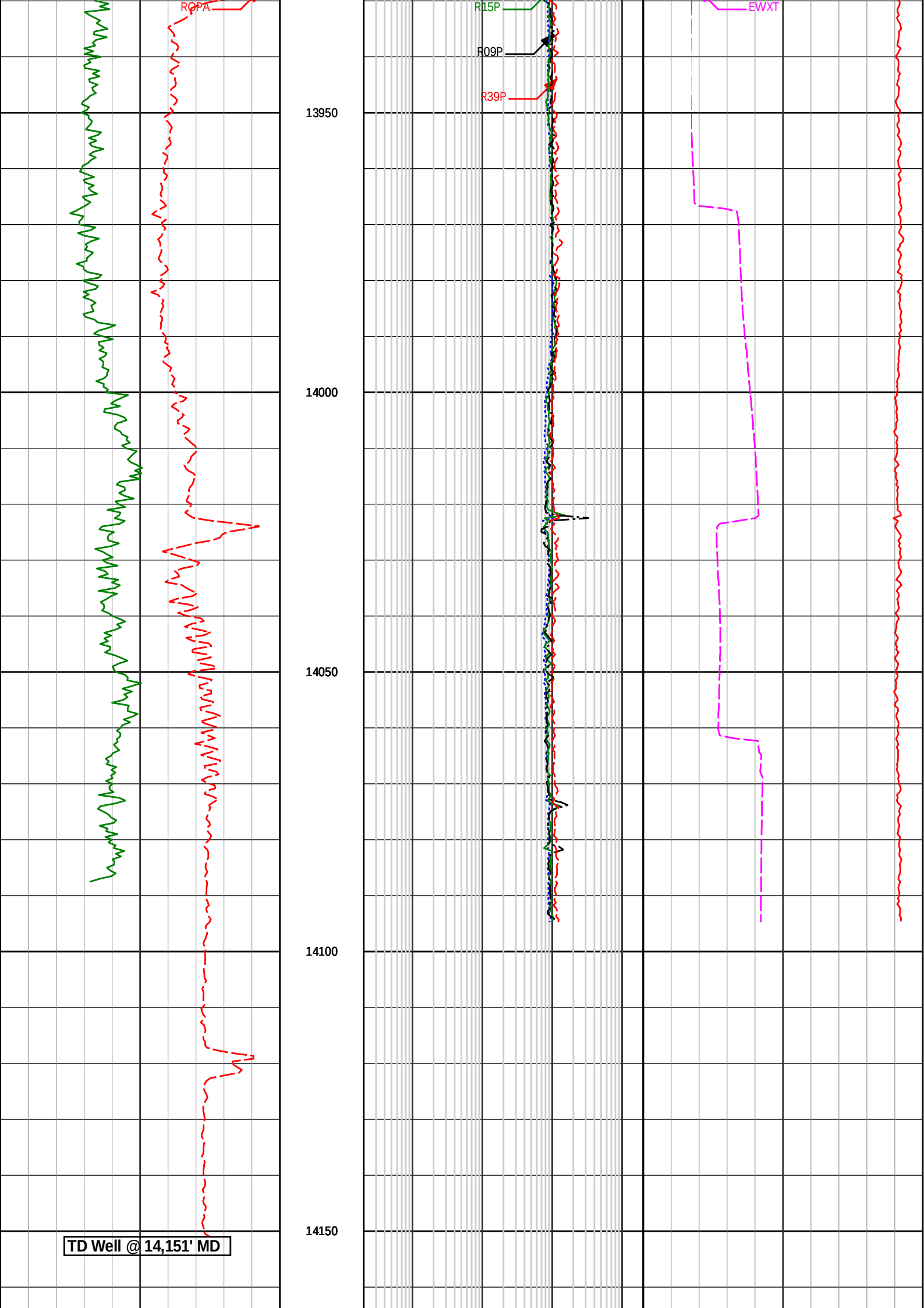
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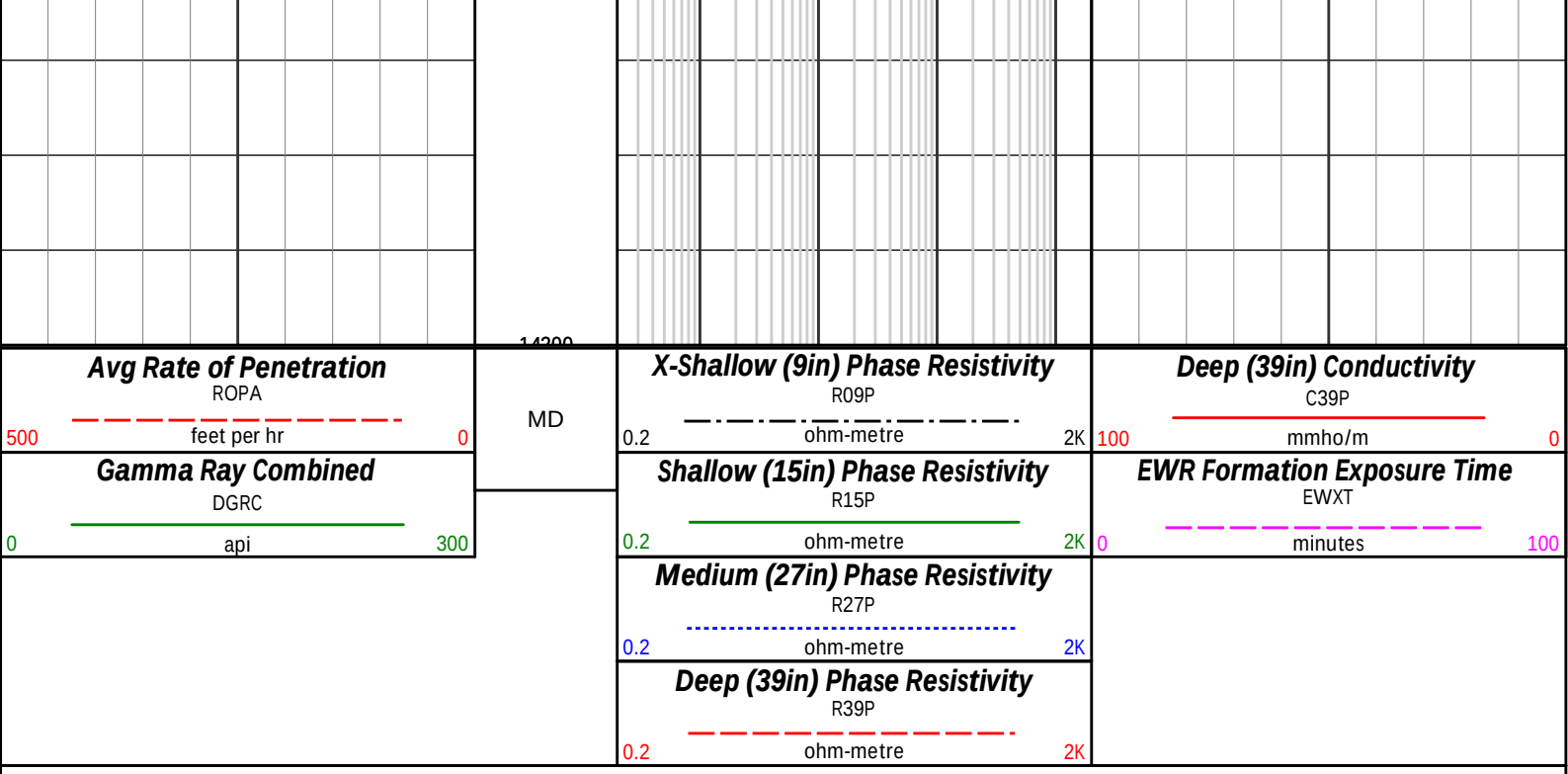
R15P
R09P
R39P
EWXT
13950
14000
14050
14100
14150
TD Well @ 14,151' MD



HALLIBURTON

Sperry Drilling Services

MD Detail Log 1:240

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp.
Nichols 1N-5HZ
Wattenburg
Weld Colorado
USA
CA-XX-0009810738

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
825.00	0.24	93.37	824.99	2.57 N	0.77 E	2.55	TIE-IN
920.00	0.50	282.91	919.99	2.65 N	0.57 E	2.64	0.77
1012.00	0.51	322.12	1011.99	3.06 N	0.07 W	3.06	0.37
1104.00	0.54	300.27	1103.98	3.60 N	0.70 W	3.62	0.22
1196.00	0.48	284.82	1195.98	3.92 N	1.45 W	3.95	0.17
1288.00	0.37	295.79	1287.98	4.15 N	2.09 W	4.19	0.15
1380.00	0.92	269.65	1379.97	4.28 N	3.09 W	4.34	0.66
1471.00	0.72	288.66	1470.96	4.45 N	4.37 W	4.54	0.37
1563.00	0.87	310.09	1562.95	5.09 N	5.45 W	5.20	0.36
1655.00	0.83	298.26	1654.94	5.85 N	6.57 W	5.98	0.19
1747.00	1.10	301.25	1746.93	6.63 N	7.91 W	6.78	0.30
1839.00	1.76	271.48	1838.90	7.12 N	10.08 W	7.32	1.06
1931.00	2.61	252.10	1930.83	6.51 N	13.49 W	6.79	1.21
2023.00	3.44	252.22	2022.71	5.03 N	18.11 W	5.39	0.91
2114.00	4.20	247.30	2113.50	2.91 N	23.79 W	3.39	0.91
2209.00	4.55	236.18	2208.23	0.53 S	30.13 W	0.08	0.96
2304.00	4.81	239.41	2302.91	4.66 S	36.69 W	-3.92	0.39
2399.00	5.22	241.97	2397.55	8.72 S	43.93 W	-7.83	0.49
2494.00	4.86	239.05	2492.18	12.82 S	51.20 W	-11.78	0.47
2588.00	4.87	231.48	2585.84	17.35 S	57.73 W	-16.18	0.68

2588.00	4.87	231.48	2585.84	17.35 S	57.73 W	-16.18	0.68
2683.00	5.81	225.41	2680.43	23.23 S	64.30 W	-21.92	1.15
2778.00	5.32	235.48	2774.98	29.10 S	71.35 W	-27.65	1.15
2872.00	5.34	239.76	2868.58	33.77 S	78.73 W	-32.17	0.42
2967.00	5.41	240.69	2963.16	38.19 S	86.45 W	-36.44	0.12
3062.00	4.97	239.22	3057.77	42.49 S	93.90 W	-40.58	0.48
3157.00	4.49	240.70	3152.45	46.42 S	100.67 W	-44.37	0.52
3252.00	4.77	250.36	3247.14	49.57 S	107.64 W	-47.38	0.87
3347.00	4.43	256.32	3341.83	51.76 S	114.92 W	-49.43	0.62
3442.00	4.47	254.63	3436.55	53.61 S	122.06 W	-51.13	0.15
3536.00	5.11	243.79	3530.22	56.43 S	129.34 W	-53.80	1.17
3631.00	4.07	248.16	3624.91	59.55 S	136.26 W	-56.78	1.16
3726.00	4.18	240.50	3719.67	62.51 S	142.40 W	-59.61	0.59
3820.00	5.10	230.72	3813.36	66.84 S	148.61 W	-63.82	1.29
3915.00	3.94	237.38	3908.07	71.27 S	154.63 W	-68.12	1.33
4010.00	4.95	235.24	4002.78	75.37 S	160.75 W	-72.10	1.08
4105.00	6.53	233.67	4097.30	80.91 S	168.48 W	-77.48	1.67
4200.00	6.39	237.56	4191.70	86.95 S	177.29 W	-83.34	0.49
4294.00	6.25	238.22	4285.12	92.45 S	186.05 W	-88.66	0.16
4389.00	5.06	244.76	4379.66	96.96 S	194.24 W	-93.00	1.43
4484.00	4.55	252.05	4474.33	99.90 S	201.61 W	-95.80	0.83
4578.00	3.06	238.49	4568.12	102.36 S	207.29 W	-98.14	1.84
4673.00	2.21	235.79	4663.02	104.71 S	210.96 W	-100.42	0.90
4767.00	0.56	309.27	4756.99	105.44 S	212.82 W	-101.11	2.25
4862.00	0.80	10.77	4851.99	104.49 S	213.05 W	-100.16	0.77
4957.00	1.51	10.55	4946.97	102.61 S	212.70 W	-98.28	0.74
5052.00	1.45	5.17	5041.94	100.19 S	212.36 W	-95.87	0.16
5146.00	1.17	342.25	5135.91	98.09 S	212.55 W	-93.77	0.62
5241.00	1.19	2.65	5230.89	96.18 S	212.80 W	-91.85	0.44
5336.00	1.22	32.22	5325.87	94.34 S	212.22 W	-90.03	0.65
5431.00	1.81	34.53	5420.84	92.25 S	210.83 W	-87.96	0.62
5525.00	0.79	18.27	5514.81	90.41 S	209.78 W	-86.14	1.14
5620.00	1.07	25.32	5609.80	88.98 S	209.19 W	-84.72	0.31
5715.00	0.87	8.57	5704.79	87.46 S	208.71 W	-83.22	0.36
5810.00	1.26	16.46	5799.77	85.75 S	208.30 W	-81.52	0.44
5904.00	1.11	343.49	5893.75	83.89 S	208.27 W	-79.66	0.73
5999.00	0.43	344.75	5988.74	82.66 S	208.63 W	-78.42	0.72
6094.00	0.07	180.87	6083.74	82.38 S	208.72 W	-78.13	0.52
6188.00	0.84	185.39	6177.74	83.12 S	208.79 W	-78.87	0.82
6283.00	1.27	185.41	6272.72	84.85 S	208.95 W	-80.61	0.45
6378.00	1.07	199.28	6367.70	86.74 S	209.34 W	-82.48	0.36
6473.00	0.53	336.39	6462.70	87.17 S	209.81 W	-82.91	1.58
6504.00	1.22	356.96	6493.69	86.71 S	209.88 W	-82.44	2.40
6536.00	1.74	356.61	6525.68	85.89 S	209.93 W	-81.62	1.63
6568.00	3.00	355.72	6557.66	84.57 S	210.02 W	-80.30	3.94
6599.00	4.64	351.26	6588.59	82.52 S	210.27 W	-78.25	5.37
6631.00	6.40	353.00	6620.44	79.48 S	210.69 W	-75.20	5.52
6662.00	7.80	353.47	6651.20	75.67 S	211.14 W	-71.38	4.53
6694.00	9.34	352.27	6682.84	70.94 S	211.73 W	-66.64	4.85
6725.00	11.14	352.10	6713.34	65.48 S	212.48 W	-61.17	5.81
6756.00	14.12	353.00	6743.59	58.76 S	213.35 W	-54.43	9.64
6788.00	17.57	353.56	6774.37	50.09 S	214.37 W	-45.74	10.80
6819.00	21.19	354.90	6803.61	39.85 S	215.40 W	-35.48	11.74
6851.00	24.67	356.48	6833.08	27.42 S	216.32 W	-23.04	11.04
6883.00	28.14	357.98	6861.73	13.21 S	217.00 W	-8.82	11.06
6914.00	31.72	358.66	6888.60	2.25 N	217.45 W	6.65	11.59
6946.00	35.42	359.03	6915.25	19.93 N	217.80 W	24.34	11.58
6977.00	39.61	359.74	6939.84	38.81 N	218.00 W	43.21	13.60
7009.00	43.43	359.45	6963.79	60.02 N	218.15 W	64.42	11.94
7041.00	46.75	359.95	6986.38	82.68 N	218.27 W	87.08	10.44
7072.00	50.74	0.24	7006.82	105.98 N	218.23 W	110.37	12.88
7104.00	54.99	0.81	7026.13	131.48 N	217.99 W	135.87	13.37
7135.00	58.16	0.89	7043.20	157.35 N	217.60 W	161.72	10.22
7167.00	62.29	0.77	7059.09	185.11 N	217.20 W	189.47	12.90
7198.00	65.53	358.86	7072.73	212.95 N	217.30 W	217.30	11.83
7230.00	68.81	358.70	7085.14	242.43 N	217.93 W	246.79	10.27
7261.00	72.12	0.03	7095.50	271.64 N	218.25 W	276.00	11.40
7293.00	75.95	0.28	7104.30	302.40 N	218.16 W	306.75	12.00
7324.00	79.29	359.73	7110.95	332.67 N	218.16 W	337.02	10.91
7356.00	83.44	359.48	7115.75	364.30 N	218.38 W	368.65	12.99
7433.00	89.75	359.97	7120.32	441.13 N	218.75 W	445.47	8.22
7528.00	89.51	359.81	7120.94	536.13 N	218.94 W	540.45	0.31
7622.00	89.81	359.93	7121.49	630.12 N	219.16 W	634.43	0.35
7714.00	90.74	0.21	7121.05	722.12 N	219.04 W	726.41	1.05
7806.00	92.04	0.84	7118.82	814.09 N	218.20 W	818.34	1.57
7898.00	92.53	0.15	7115.15	906.01 N	217.41 W	910.23	0.93

7990.00	91.85	0.97	7111.62	997.94 N	216.52 W	1002.12	1.16
8082.00	92.35	0.38	7108.25	1089.87 N	215.44 W	1094.01	0.83
8174.00	91.54	1.06	7105.13	1181.81 N	214.29 W	1185.90	1.14
8266.00	92.04	0.85	7102.25	1273.75 N	212.76 W	1277.80	0.58
8357.00	90.49	0.91	7100.24	1364.71 N	211.35 W	1368.71	1.70
8449.00	90.37	0.90	7099.55	1456.70 N	209.90 W	1460.65	0.13
8541.00	90.49	0.47	7098.86	1548.69 N	208.79 W	1552.60	0.48
8633.00	90.49	359.76	7098.06	1640.69 N	208.60 W	1644.57	0.77
8725.00	90.43	1.67	7097.32	1732.67 N	207.46 W	1736.52	2.07
8817.00	90.19	1.05	7096.82	1824.64 N	205.27 W	1828.43	0.72
8909.00	90.43	0.61	7096.32	1916.63 N	203.94 W	1920.37	0.55
9001.00	89.69	0.99	7096.22	2008.62 N	202.65 W	2012.31	0.91
9093.00	91.05	0.84	7095.63	2100.61 N	201.19 W	2104.25	1.49
9184.00	90.12	1.66	7094.70	2191.58 N	199.20 W	2195.16	1.36
9276.00	88.76	2.04	7095.59	2283.52 N	196.23 W	2287.03	1.53
9368.00	88.83	1.60	7097.53	2375.46 N	193.31 W	2378.88	0.48
9459.00	88.95	1.51	7099.30	2466.41 N	190.84 W	2469.76	0.16
9551.00	88.83	1.27	7101.08	2558.36 N	188.61 W	2561.66	0.29
9643.00	90.37	0.55	7101.72	2650.34 N	187.15 W	2653.59	1.85
9735.00	91.73	0.17	7100.04	2742.32 N	186.57 W	2745.54	1.53
9827.00	91.98	0.16	7097.06	2834.28 N	186.30 W	2837.47	0.27
9919.00	91.92	359.73	7093.94	2926.22 N	186.39 W	2929.40	0.48
10011.00	90.43	0.78	7092.05	3018.20 N	185.98 W	3021.34	1.98
10103.00	91.92	0.11	7090.17	3110.17 N	185.26 W	3113.29	1.77
10195.00	91.98	359.89	7087.04	3202.12 N	185.26 W	3205.21	0.25
10287.00	91.05	0.66	7084.61	3294.09 N	184.82 W	3297.15	1.31
10378.00	91.05	0.44	7082.94	3385.07 N	183.95 W	3388.10	0.25
10470.00	91.17	359.99	7081.16	3477.05 N	183.61 W	3480.05	0.51
10565.00	91.24	359.58	7079.16	3572.03 N	183.97 W	3575.02	0.43
10659.00	91.54	359.10	7076.88	3665.99 N	185.05 W	3668.99	0.61
10754.00	91.79	1.11	7074.12	3760.95 N	184.88 W	3763.92	2.13
10849.00	91.79	0.44	7071.14	3855.89 N	183.60 W	3858.82	0.71
10944.00	91.85	0.39	7068.12	3950.84 N	182.91 W	3953.73	0.08
11038.00	91.24	2.01	7065.59	4044.78 N	180.95 W	4047.62	1.85
11133.00	91.17	1.73	7063.59	4139.71 N	177.85 W	4142.46	0.30
11228.00	89.94	1.57	7062.67	4234.66 N	175.11 W	4237.34	1.31
11323.00	89.75	1.44	7062.93	4329.63 N	172.61 W	4332.24	0.24
11418.00	89.75	1.04	7063.34	4424.61 N	170.55 W	4427.15	0.42
11513.00	89.94	1.05	7063.59	4519.59 N	168.82 W	4522.08	0.20
11608.00	89.88	0.43	7063.75	4614.58 N	167.59 W	4617.03	0.65
11702.00	90.00	359.99	7063.85	4708.58 N	167.24 W	4711.00	0.49
11797.00	90.31	0.14	7063.59	4803.58 N	167.14 W	4805.98	0.36
11892.00	90.93	0.87	7062.57	4898.57 N	166.30 W	4900.93	1.01
11987.00	91.23	0.78	7060.78	4993.54 N	164.94 W	4995.86	0.34
12081.00	90.80	0.18	7059.11	5087.53 N	164.15 W	5089.81	0.79
12176.00	90.37	359.41	7058.13	5182.52 N	164.50 W	5184.79	0.93
12271.00	91.92	358.86	7056.24	5277.49 N	165.93 W	5279.76	1.73
12365.00	91.85	358.59	7053.15	5371.41 N	168.02 W	5373.71	0.30
12460.00	90.93	0.24	7050.84	5466.37 N	168.99 W	5468.68	1.99
12555.00	90.49	359.95	7049.66	5561.37 N	168.84 W	5563.65	0.55
12649.00	92.04	359.97	7047.58	5655.34 N	168.91 W	5657.60	1.64
12744.00	93.09	1.71	7043.33	5750.23 N	167.53 W	5752.44	2.14
12839.00	93.40	1.12	7037.95	5845.05 N	165.19 W	5847.19	0.70
12934.00	92.41	1.47	7033.14	5939.90 N	163.04 W	5941.98	1.10
13029.00	91.17	2.43	7030.17	6034.80 N	159.81 W	6036.79	1.65
13124.00	89.69	1.83	7029.45	6129.72 N	156.28 W	6131.63	1.69
13219.00	90.00	2.47	7029.70	6224.66 N	152.73 W	6226.47	0.75
13313.00	90.49	2.47	7029.30	6318.57 N	148.68 W	6320.28	0.53
13408.00	90.99	2.42	7028.07	6413.47 N	144.63 W	6415.09	0.52
13503.00	91.30	2.19	7026.17	6508.38 N	140.82 W	6509.90	0.40
13598.00	91.79	2.01	7023.61	6603.28 N	137.34 W	6604.71	0.55
13692.00	90.62	1.99	7021.63	6697.20 N	134.07 W	6698.54	1.25
13787.00	88.14	1.24	7022.66	6792.15 N	131.40 W	6793.42	2.72
13882.00	88.27	0.79	7025.63	6887.09 N	129.72 W	6888.30	0.49
13977.00	88.64	0.41	7028.20	6982.05 N	128.72 W	6983.22	0.56
14071.00	89.07	359.74	7030.07	7076.03 N	128.60 W	7077.18	0.85
14106.00	89.26	359.95	7030.58	7111.02 N	128.69 W	7112.17	0.79
14150.00	89.26	359.95	7031.15	7155.02 N	128.73 W	7156.16	0.01

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD

VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 358.84 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.64 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 14150.00 FEET
IS 7156.18 FEET ALONG 358.97 DEGREES (TRUE)

Final survey is a projection to bit.

Date Printed:18 January 2013