

## 1 : 240

WELL INFORMATION					
MWD Run Number	100	200	300	400	
Date run completed	03-Jun-13	04-Jun-13	28-Jun-13	30-Jun-13	
Rig Bit Number	0100	0200	0300	0400	
Bit Size (in)	8.750	8.750	6.125	6.125	
Tool Nominal OD (in)	6.860	6.750	4.750	4.750	
Log Start Depth (MD, ft)	1,042.00	6,850.00	7,778.00	9,196.00	
Log End Depth (MD, ft)	6,850.00	7,778.00	9,195.00	11,910.00	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	01-Jun-13 12:45	03-Jun-13 07:40	27-Jun-13 15:21	28-Jun-13 19:19	
Drill/Wipe End Date and Time	02-Jun-13 19:00	04-Jun-13 00:34	28-Jun-13 06:38	29-Jun-13 23:16	
Min Inc (deg) @ Depth (MD, ft)	.40 @ 1,531.00	3.20 @ 6,876.00	86.54 @ 7,860.00	87.47 @ 9,575.00	
Max Inc (deg) @ Depth (MD, ft)	11.02 @ 3,087.00	90.00 @ 7,778.00	92.23 @ 8,117.00	95.20 @ 10,517.00	
Bit TFA(in2) / Bit Type	1.49 / N/A	1.49 / N/A	0.9817 / N/A	.9817 / N/A	
Flow Rate (gpm)	613.61	525.33	293.04	304.00	
Max AV (fpm) / CV (fpm) @ MWD	349.2 / 214.2	272.5 / 252.9	282.86 / 233.95	324.34 / 320.48	
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel	
Density (ppg) / Viscosity (spqt)	8.70 / 38.00	10.00 / 40.00	9.75 / 39.00	9.65 / 43.00	
Filtrate CL (ppm)	1,500.00	1,700.00	1,467.00	1,467.00	
pH / Fluid Loss (mptm)	8.50 / 6	9.00 / 4	9.00 / 5	9.00 / 4	
PV (cP) / YP (Ihf2)	6 / 6.00	9 / 8.00	7 / 6.00	13 / 10.00	
% Solids / % Sand	2.70 / 0.20	9.00 / 0.25	8.00 / 0.25	7.00 / 0.25	
% 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 (deg F) @ S	170.70 / 100M	170.70 / 100M	200.05 / 100M	200.05 / 100M	



Max Tool Temp (degF) / Source	172.78 / PCM	172.78 / PCM	229.65 / HCIM	229.65 / HCIM	
Rm @ Max Tool Temp (degF)	N/A @ 172.78	N/A @ 172.78	N/A @ 229.65	N/A @ 229.65	
Lead MWD Engineer	Matt Busche	Matt Busche	Caleb Jones	Caleb Jones	
Customer Representative	David Cornett	David Cornett	Pete Perry	Pete Perry	

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM	HCIM	HCIM	
Software Version	5.84	5.84	88.47	88.56	
Sub Serial Number	11305516	11305516	90359967	90366768	
Insert Serial Number	11400878	11400878	123	123	
Date and Time Initialized	31-May-13 10:53	31-May-13 10:53	27-Jun-13 08:08	28-Jun-13 14:11	
Date and Time Read	04-Jun-13 11:42	04-Jun-13 11:35	28-Jun-13 12:08	30-Jun-13 07:47	
ECMB SW Version	N/A	N/A	N/A	N/A	

### Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	50.88	46.55	47.30	47.50	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	11305516	11305516	11426049	11122424	
Sonde Serial Number	11181531	11181531	11478096	11297491	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	170.89	23.70	222.06	182.65	

### Gamma Ray Sensor Information

Tool Type	PCG	PCG	DGR	DGR	
Distance From Bit (ft)	55.83	51.50	69.08	69.41	
Recorded Sample Period (sec)	10	10	12	8	
Software Version	8.15	8.15	N/A	N/A	
Sub Serial Number	11305516	11305516	90359967	90366768	
Insert/Sonde Serial Number	11579809	11579809	Legacy 88720	10436112	

### Resistivity Sensor Information

Tool Type			Slim P4	Slim P4	
Distance From Bit (ft)			62.10	62.43	
Recorded Sample Period (sec)			12	12	
Software Version			5.55	5.55	
Sub Serial Number			240135	108711	
Receiver Insert Serial Number			265025	228747	
Transmitter Insert Serial Number			243460	175830	
Receiver Orientation			Down	Down	

## REMARKS

1. Depths are true vertical depths, referenced to the Driller's pipe tally and are measured from the Kelly Bushing, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.
4. All data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:



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

PGRC (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

Insite version: 7.4.20

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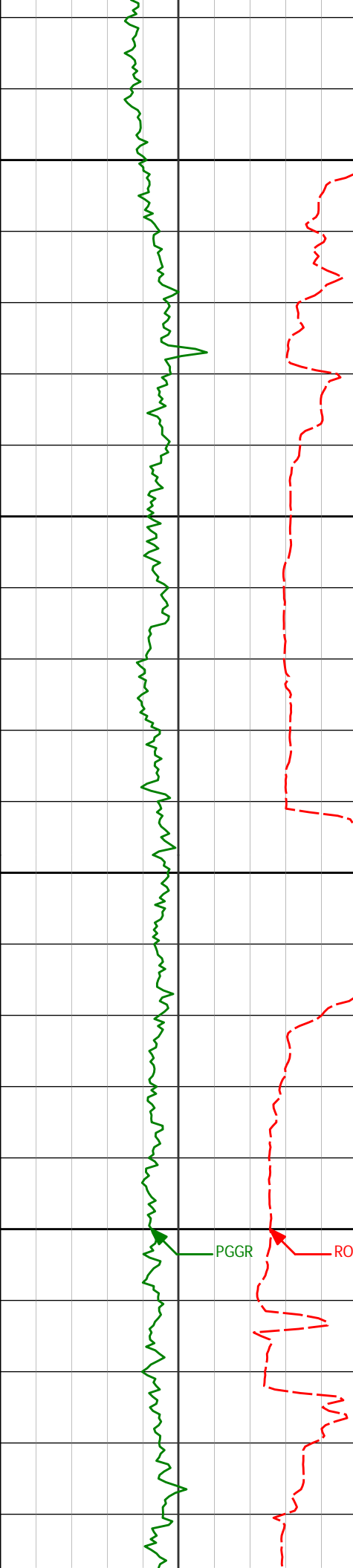
Sperry Drilling Services

MD Detail Log 1:240

Company: Anadarko PC  
Well: Wishbone 29N-E24HZ  
Rig: Xtreme 22  
Township and Range: T2N - R66W

<div>PCG Gamma Ray</div> <div>PGRC</div> <div><div>0</div><div>api</div><div>300</div></div>							
<div>Avg Rate of Penetration</div> <div>ROPA</div> <div><div>500</div><div>feet per hr</div><div>0</div></div>							
<div>DGR Gamma Ray</div> <div>DGRC</div> <div><div>0</div><div>api</div><div>300</div></div>		Depth ft					
		0000	Depth	Inc	Azi	TVD	VS
<div></div>							
<div></div>							
<div></div>							

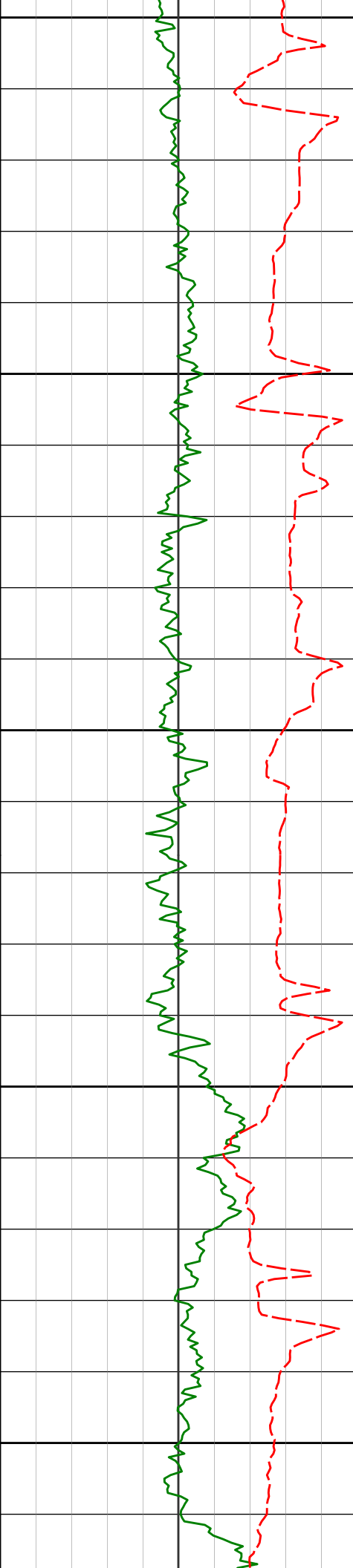




Run 200

6833'	0.07°	207.69°	6814.57'	-262.19'
6876'	3.20°	354.20°	6857.54'	-261.02'
6919'	8.52°	1.95°	6900.31'	-256.64'
6962'	14.65°	3.97°	6942.41'	-248.02'
7004'	19.81°	4.64°	6982.51'	-235.63'
7047'	22.79°	5.87°	7022.57'	-220.08'





7050

7090'

26.01°

7.69°

7061.72'

-202.45'

7100

7133'

31.07°

4.53°

7099.49'

-182.04'

7150

7175'

36.58°

3.73°

7134.36'

-158.74'

7200

7218'

41.92°

2.75°

7167.65'

-131.59'

7250

7261'

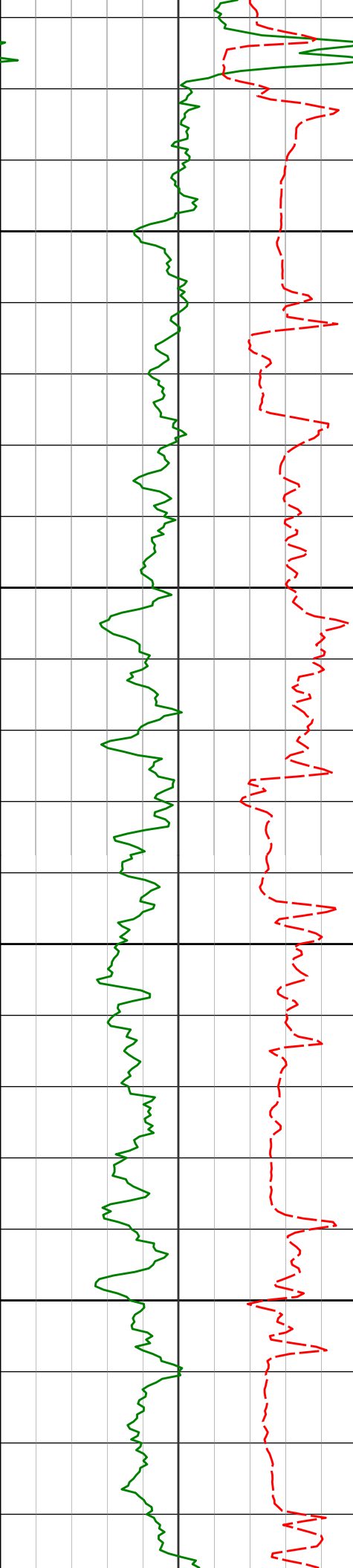
47.09°

1.35°

7198.31'

-101.49'





7300

7304'

51.78°

0.76°

7226.27'

-68.84'

7350

7346'

54.82°

2.20°

7251.36'

-35.19'

7400

7389'

58.04°

1.93°

7275.14'

0.61'

7450

7432'

60.16°

1.66°

7297.22'

37.48'

7475'

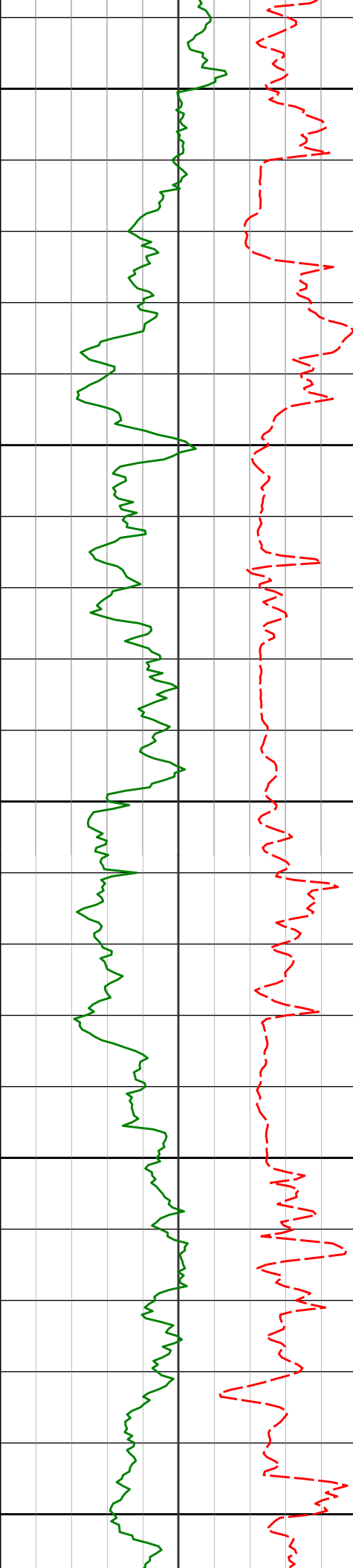
62.97°

1.91°

7317.69'

75.26'





7500

7517'

66.21°

1.13°

7335.71'

113.18'

7550

7559'

68.31°

0.58°

7351.95'

151.90'

7600

7603'

69.08°

359.55°

7367.94'

192.89'

7650

7645'

71.33°

0.43°

7382.16'

232.41'

7700

7688'

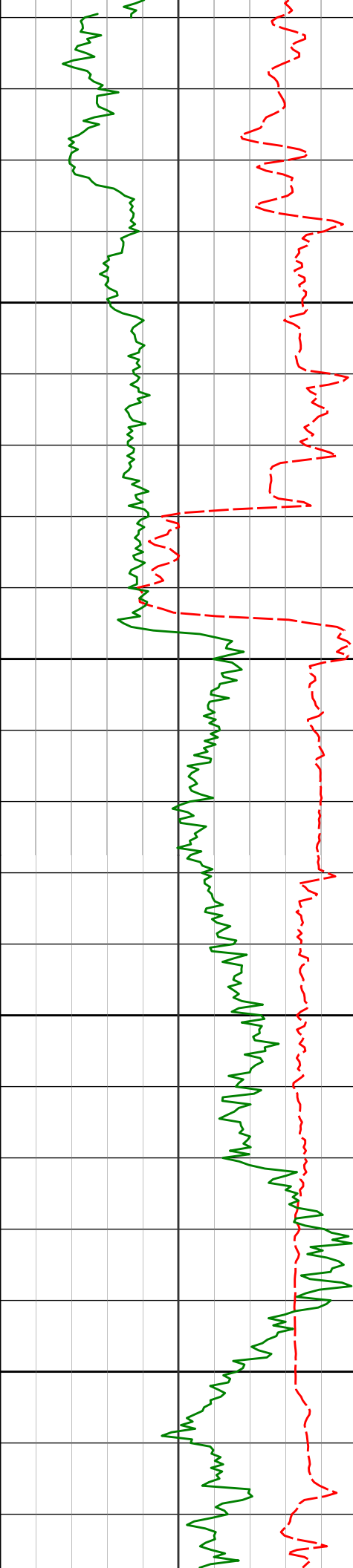
76.04°

0.67°

7394.24'

273.66'





End PCG, Begin DGR

7729'

82.68°

1.28°

7401.81'

313.92'

7750

Casing @ 7755' MD

Run 300

7800

7850

7860'

86.54°

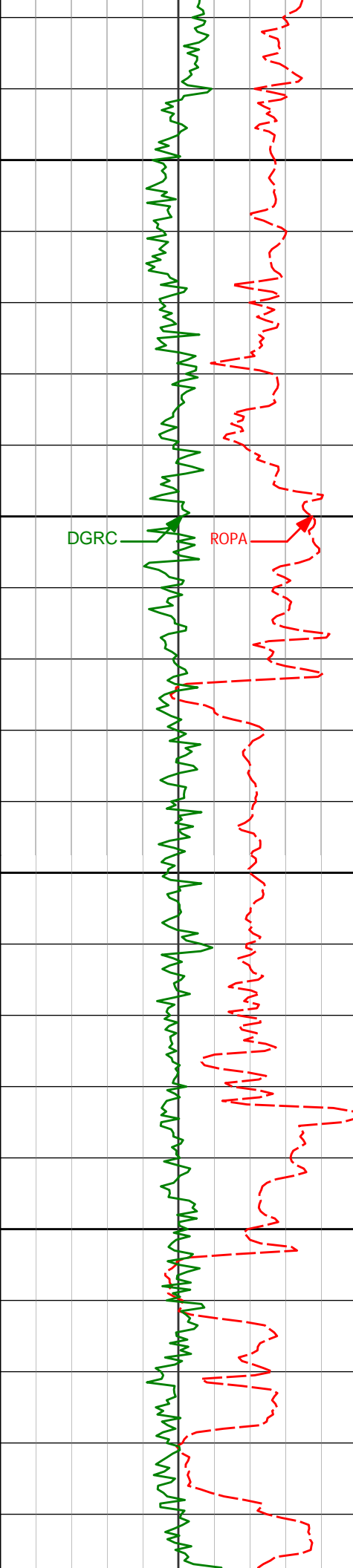
358.58°

7414.11'

444.30'

7900





7946'	88.33°	359.46°	7417.96'	530.21'
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7950

8000

DGRC

ROPA

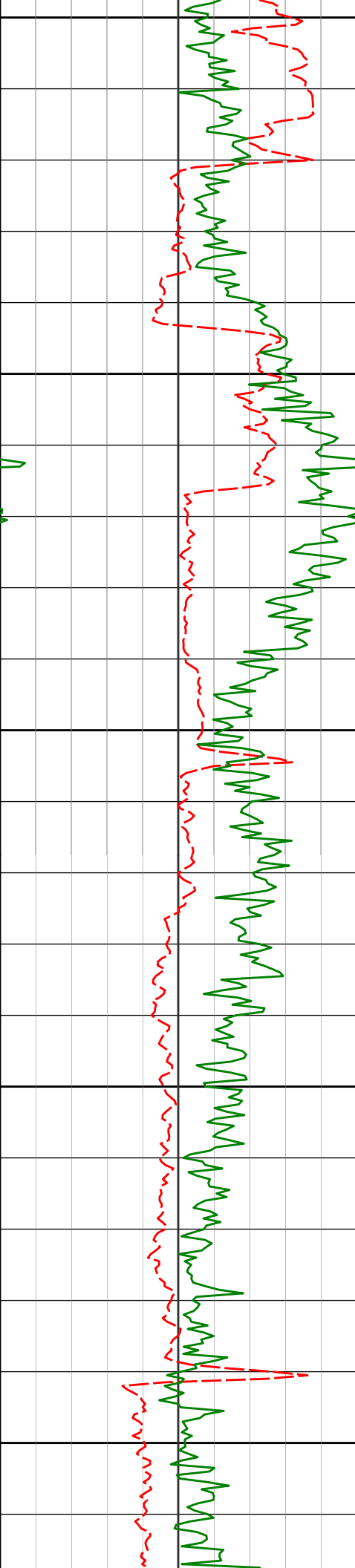
8032'	90.25°	358.30°	7419.03'	616.19'
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8050

8100

8117'	92.23°	358.83°	7417.19'	701.14'
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8150

8200

8250

8300

8350

8203'

92.10°

358.11°

7413.95'

787.06'

8289'

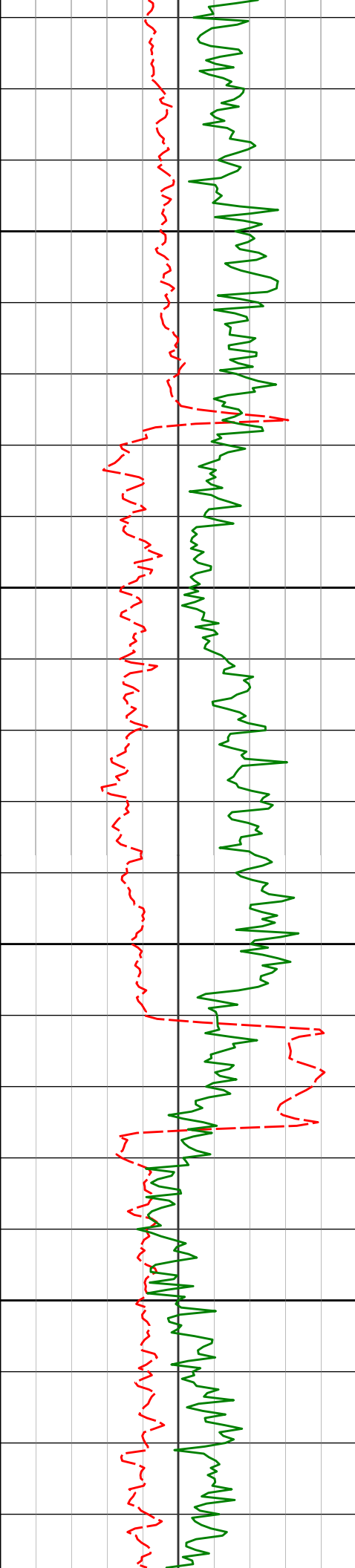
91.98°

357.55°

7410.89'

872.96'





8374'

91.92°

357.21°

7408.00'

957.83'

8400

8450

8460'

91.61°

357.16°

7405.35'

1043.71'

8500

8545'

91.98°

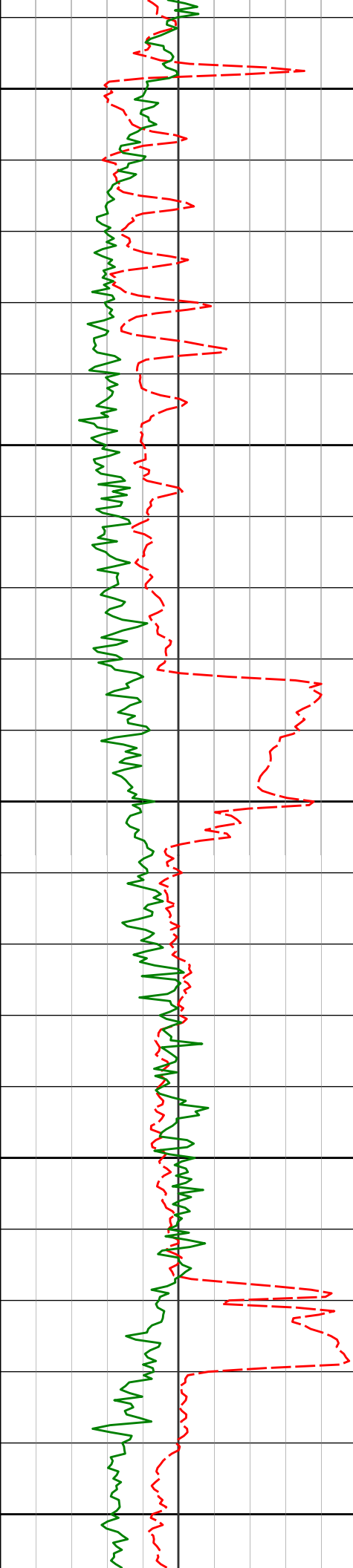
357.74°

7402.70'

1128.60'

8550





8600

8631'

91.48°

357.18°

7400.10'

1214.49'

8650

8700

8717'

91.11°

359.17°

7398.15'

1300.43'

8750

8800

8803'

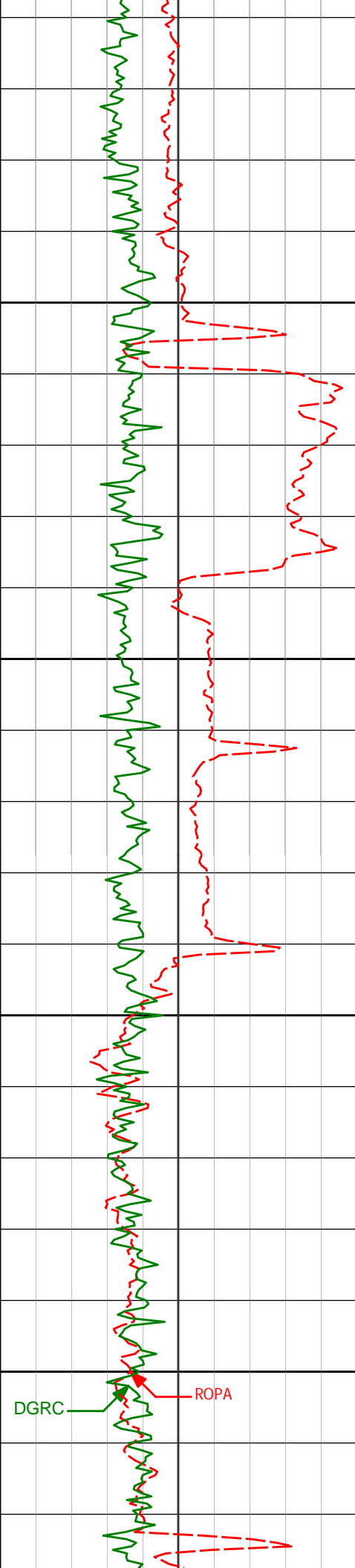
91.42°

357.67°

7396.25'

1386.38'





8850

8900

8950

9000

8888'

90.62°

0.29°

7394.74'

1471.35'

8974'

90.25°

359.13°

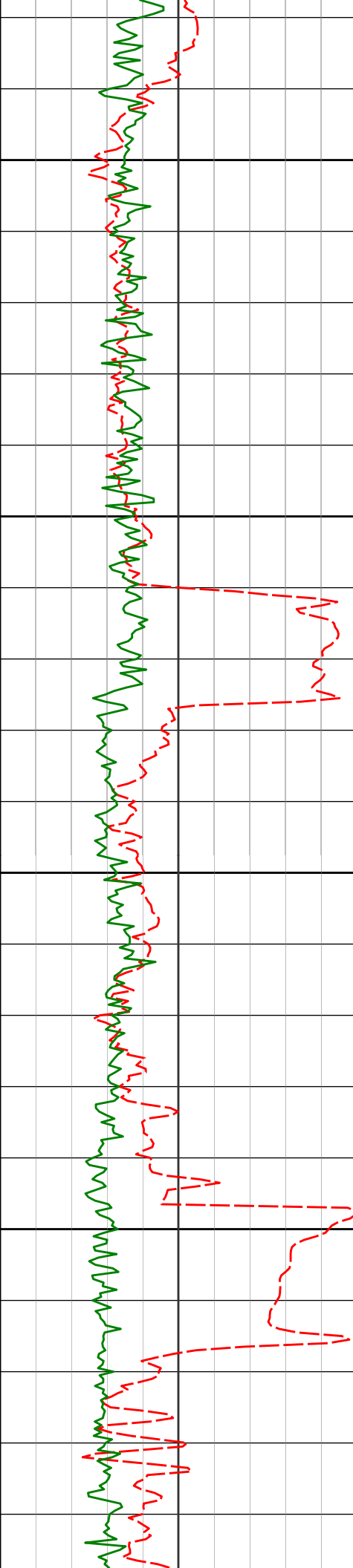
7394.09'

1557.35'

DGRC

ROPA





9050

9060'

90.49°

358.52°

7393.53'

1643.34'

9100

9150

9146'

91.05°

356.89°

7392.37'

1729.27'

Run 400  
9200

9232'

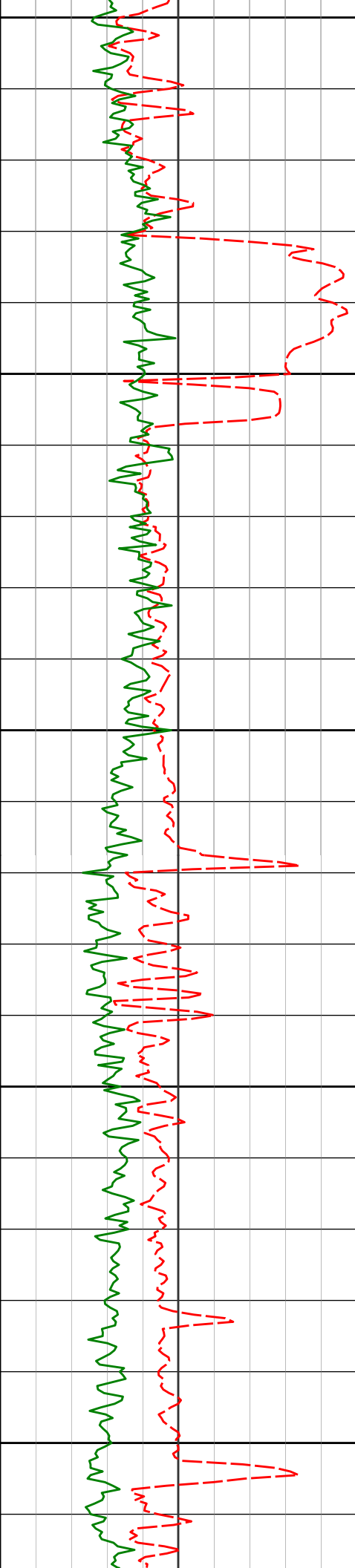
89.07°

357.72°

7392.28'

1815.19'





9250

9300

9350

9400

9450

9317'

88.52°

0.79°

7394.07'

1900.15'

9403'

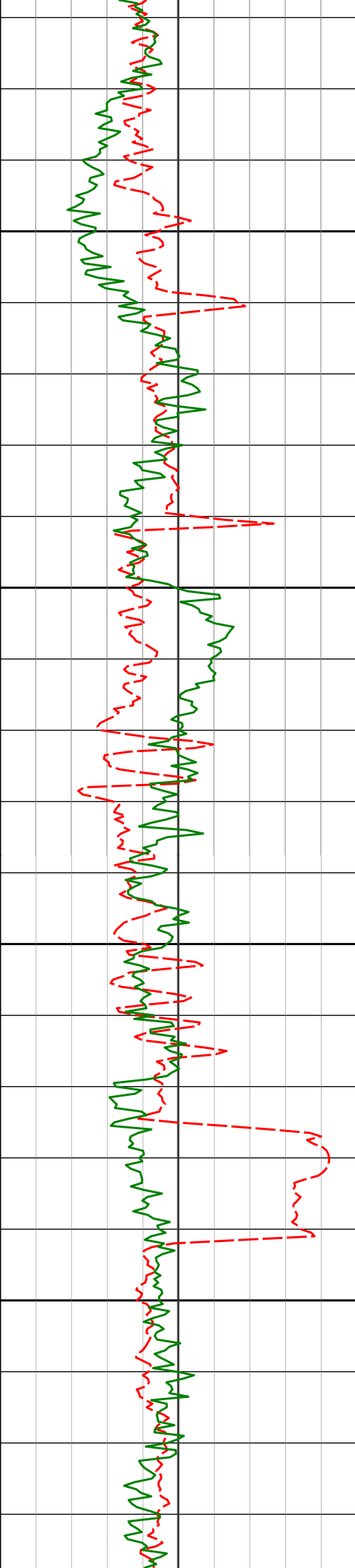
88.95°

1.01°

7395.97'

1986.12'





9489'

88.08°

359.92°

7398.19'

2072.08'

9500

9550

9575'

87.47°

359.22°

7401.53'

2158.01'

9600

9650

9660'

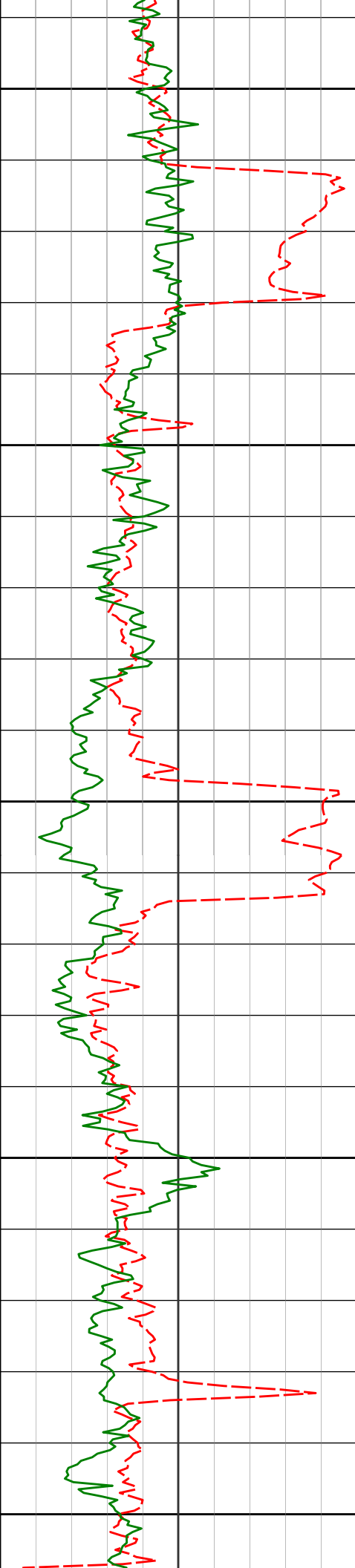
88.76°

359.54°

7404.33'

2242.96'





9700

9750

9800

9850

9900

9746'

90.99°

359.30°

7404.51'

2328.96'

9832'

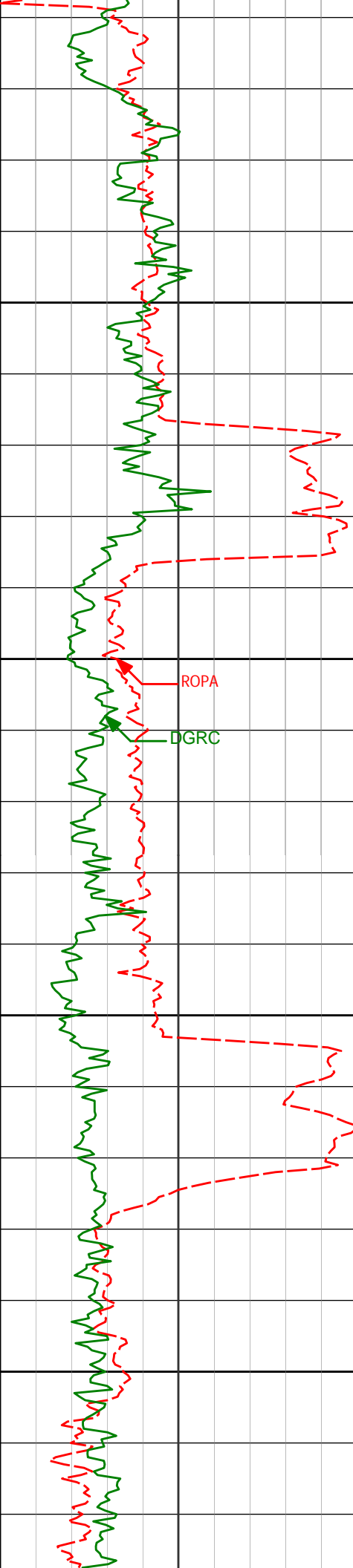
93.03°

359.50°

7401.50'

2414.90'





9918'	91.61°	358.52°	7398.03'	2500.82'
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9950

10000

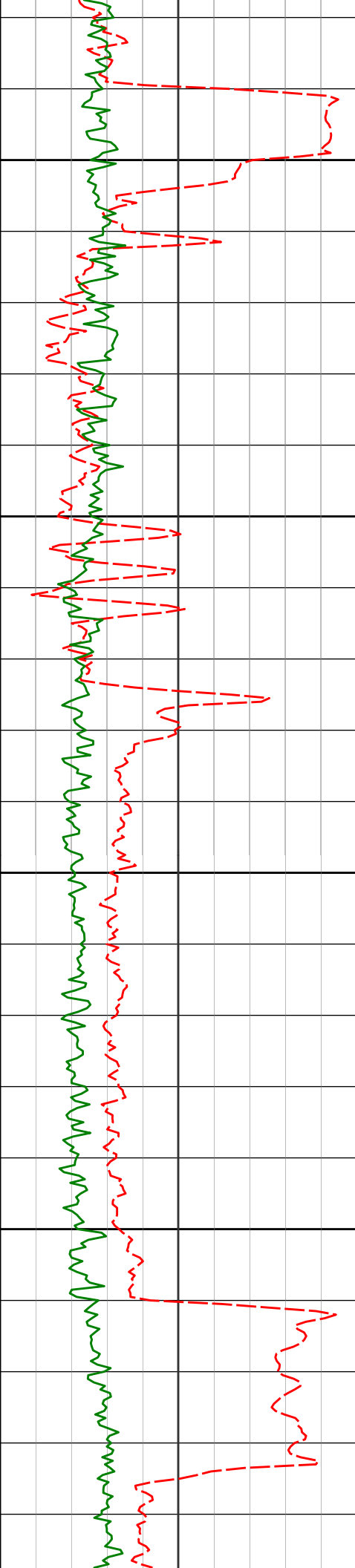
10003'	92.22°	358.45°	7395.18'	2585.75'
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10050

10089'	93.09°	358.24°	7391.20'	2671.63'
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10100





10150

10200

10250

10300

10175'

93.33°

358.97°

7386.38'

2757.47'

10260'

92.53°

358.02°

7382.03'

2842.34'

10346'

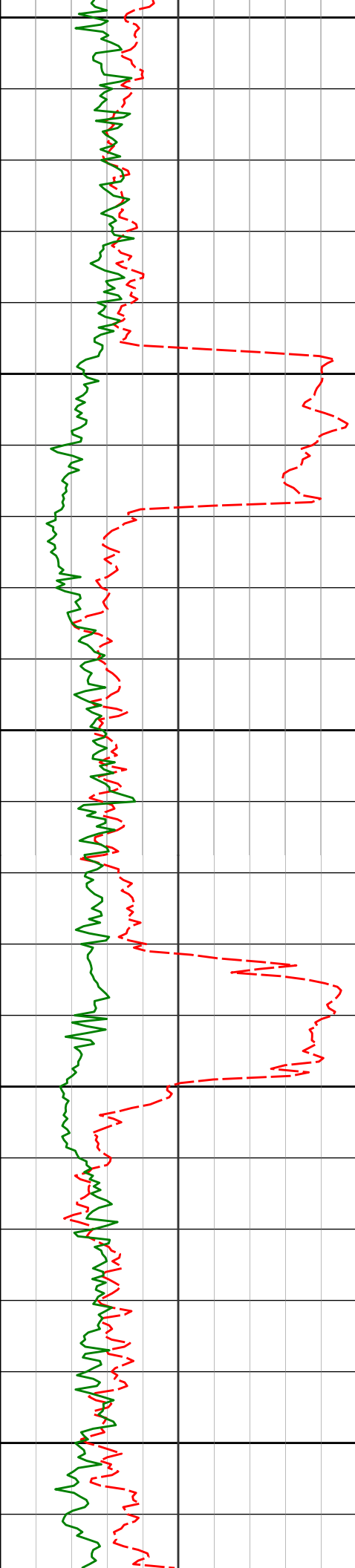
91.36°

358.03°

7379.11'

2928.25'





10350

10400

10450

10500

10550

10432'

94.21°

359.10°

7374.93'

3014.12'

10517'

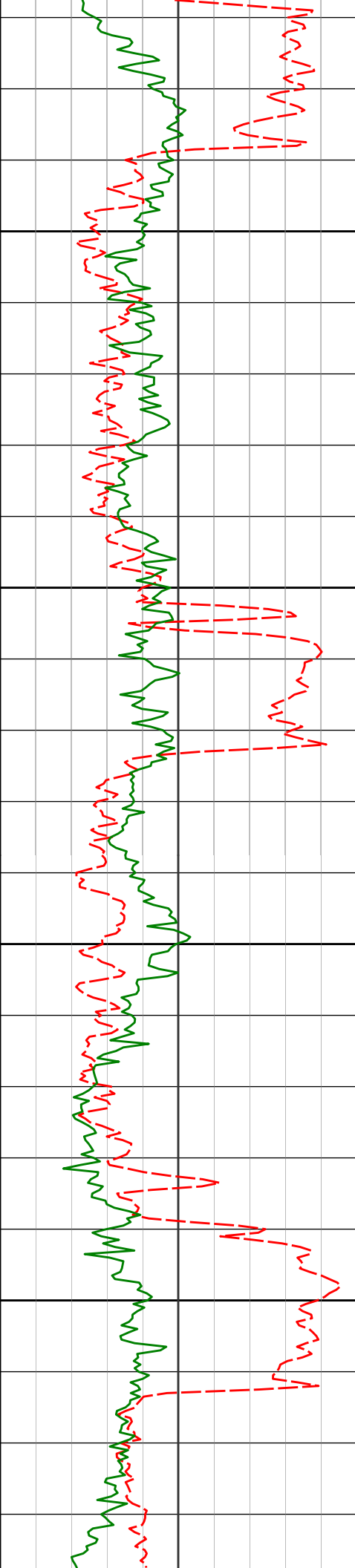
95.20°

359.98°

7367.96'

3098.83'





10600

10603'

93.71°

0.18°

7361.29'

3184.57'

10650

10689'

93.40°

0.72°

7355.96'

3270.40'

10700

10750

10775'

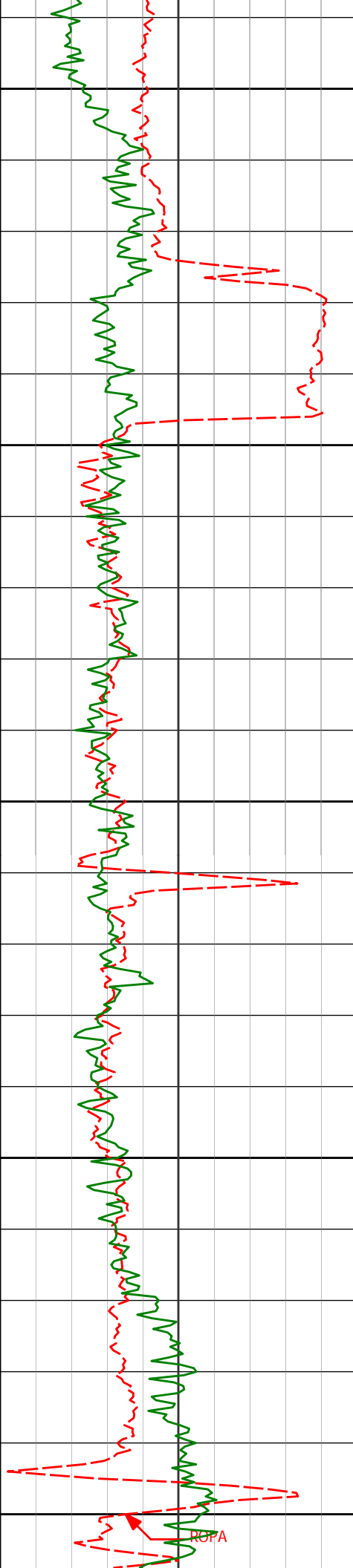
91.85°

1.46°

7352.02'

3356.28'





10800

10850

10900

10950

11000

10860'

90.86°

2.39°

7350.00'

3441.19'

10946'

91.36°

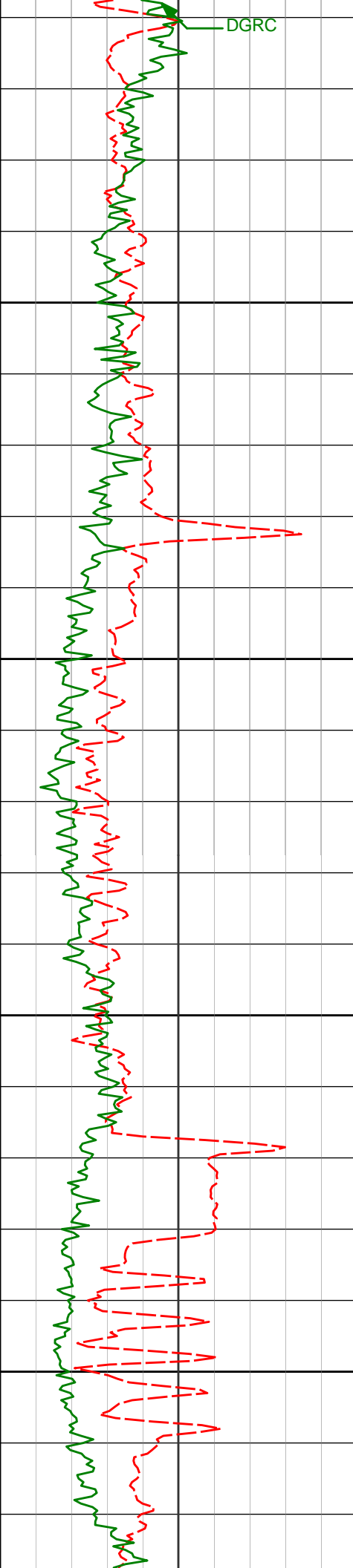
1.70°

7348.34'

3527.11'

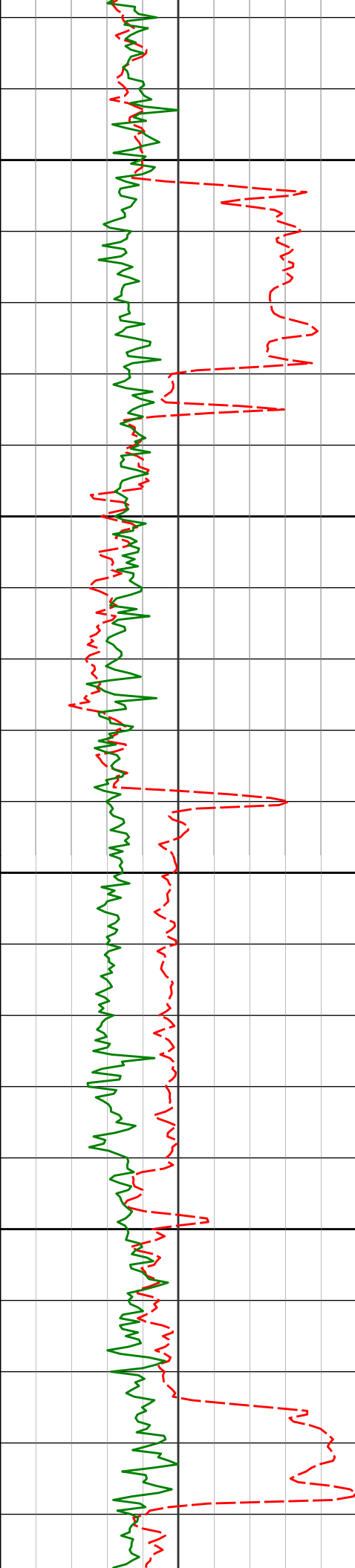
ROPA





11032'	90.93°	0.91°	7346.62'	3613.06'
11050				
11100				
11118'	91.36°	0.38°	7344.91'	3699.03'
11150				
11200				
11203'	91.85°	359.41°	7342.53'	3783.99'





11250

11300

11350

11400

11289'

90.74°

359.25°

7340.59'

3869.97'

11375'

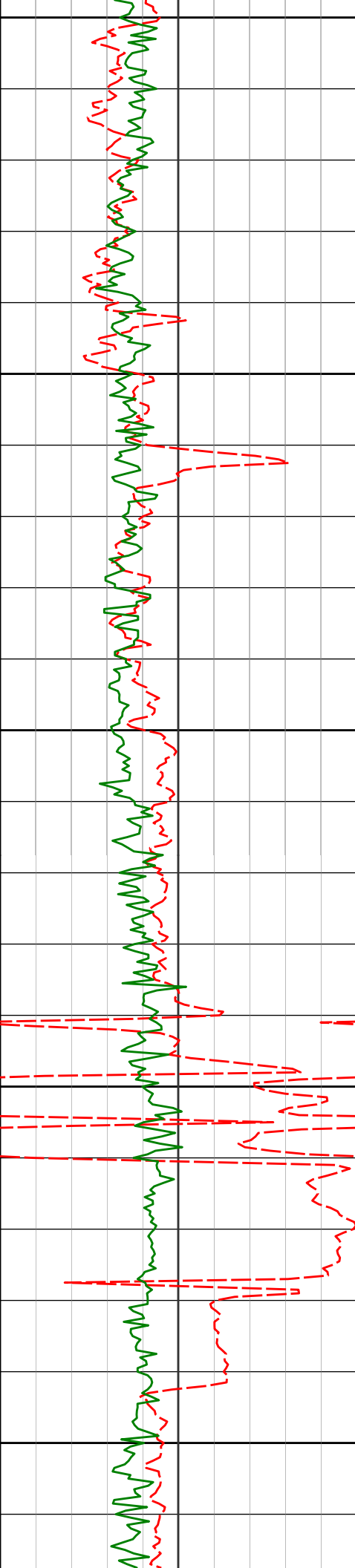
90.80°

358.36°

7339.43'

3955.95'





11450

11461'

90.62°

358.91°

7338.36'

4041.93'

11500

11550

11546'

90.43°

358.12°

7337.58'

4126.90'

11600

11632'

89.01°

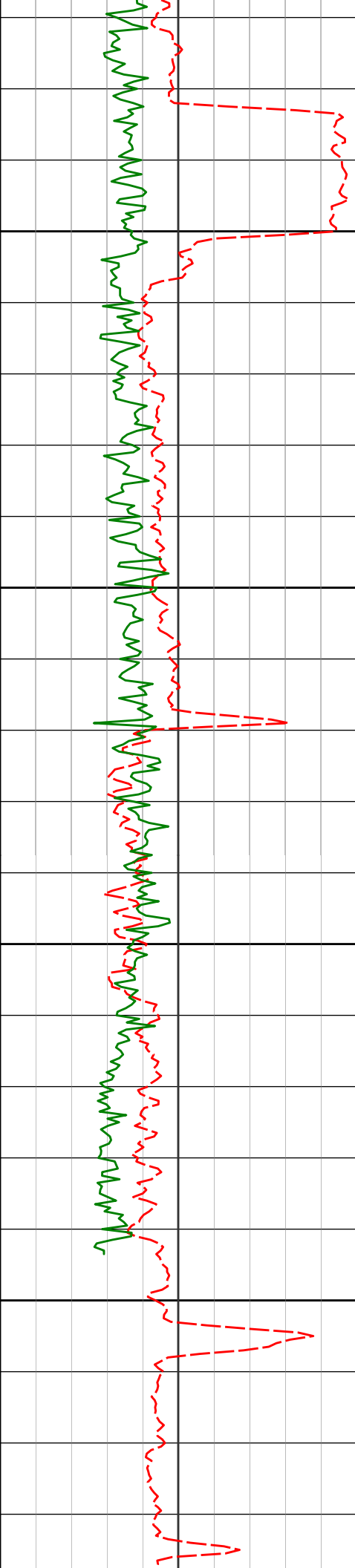
358.75°

7338.00'

4212.88'

11650





11700

11750

11800

11850

11718'

88.77°

0.23°

7339.67'

4298.86'

11803'

87.90°

359.24°

7342.15'

4383.82'

11860'

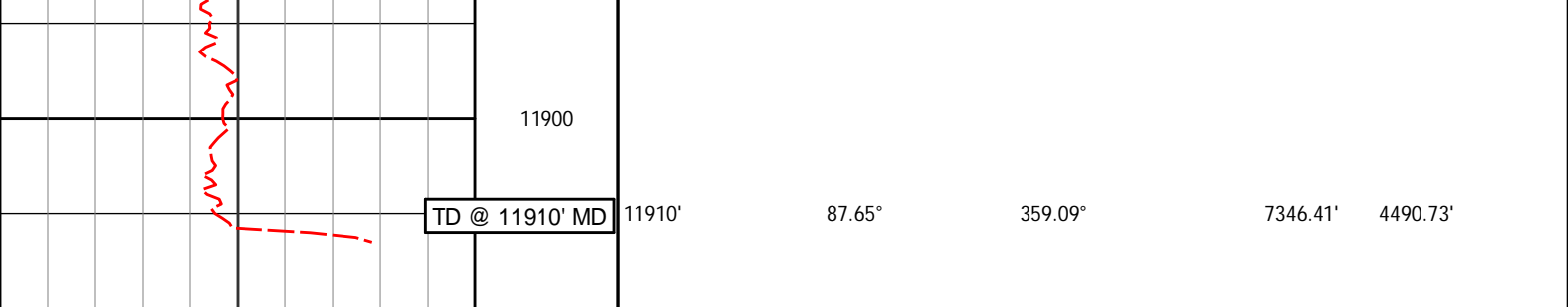
87.65°

359.09°

7344.36'

4440.77'





DGR Gamma Ray		Depth ft	Depth	Inc	Azi	TVD	VS
DGRC	api						
0	300						
Avg Rate of Penetration							
ROPA	feet per hr						
500	0						
PCG Gamma Ray							
PGRC	api						
0	300						



## HALLIBURTON

### DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corporation  
Wishbone 29N-E24HZ  
Wattenburg  
Weld Colorado  
USA  
CA-XX-0900382955

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
1001.00	0.90	195.46	1000.97	5.08 S	0.05 W	-5.08	TIE-IN
1256.00	0.63	191.93	1255.95	8.39 S	0.88 W	-8.39	0.11
1531.00	0.40	227.85	1530.94	10.53 S	1.90 W	-10.52	0.14
1804.00	0.98	219.82	1803.92	12.97 S	4.11 W	-12.95	0.22
1896.00	0.95	235.32	1895.90	14.01 S	5.24 W	-13.99	0.29
1988.00	2.45	224.90	1987.86	15.83 S	7.26 W	-15.80	1.66
2080.00	3.18	216.33	2079.75	19.29 S	10.16 W	-19.24	0.92
2171.00	4.12	202.25	2170.56	24.35 S	12.89 W	-24.29	1.42
2263.00	5.58	188.92	2262.24	31.83 S	14.84 W	-31.76	1.99
2355.00	6.71	175.36	2353.71	41.60 S	15.10 W	-41.53	1.99
2447.00	8.24	167.59	2444.93	53.40 S	13.24 W	-53.34	1.99
2538.00	7.61	161.49	2535.06	65.48 S	9.93 W	-65.44	1.15
2630.00	9.27	160.77	2626.06	78.26 S	5.55 W	-78.23	1.81
2721.00	10.43	149.00	2715.73	92.24 S	1.10 E	-92.24	2.54
2812.00	9.99	147.99	2805.29	105.99 S	9.53 E	-106.03	0.52
2904.00	9.52	165.91	2895.98	120.14 S	15.61 E	-120.21	3.33
2995.00	10.92	182.08	2985.55	136.06 S	17.13 E	-136.13	3.49
3087.00	11.02	187.40	3075.87	153.48 S	15.68 E	-153.55	1.11
3173.00	10.87	187.66	3160.31	169.67 S	13.54 E	-169.73	0.19
3259.00	10.26	188.99	3244.85	185.27 S	11.26 E	-185.32	0.77
3344.00	8.70	180.17	3328.69	199.17 S	10.06 E	-199.21	2.50
3430.00	6.94	188.33	3413.89	210.81 S	9.29 E	-210.85	2.41
3516.00	6.23	189.92	3499.32	220.55 S	7.73 E	-220.58	0.84
3602.00	4.81	188.84	3584.92	228.72 S	6.37 E	-228.74	1.66
3687.00	4.04	186.51	3669.67	235.21 S	5.48 E	-235.23	0.94
3773.00	3.52	185.31	3755.48	240.85 S	4.90 E	-240.87	0.61
3859.00	2.86	169.01	3841.35	245.58 S	5.06 E	-245.60	1.30
3945.00	1.70	185.38	3927.28	248.95 S	5.35 E	-248.97	1.54
4030.00	2.00	205.05	4012.24	251.55 S	4.60 E	-251.57	0.82
4116.00	1.88	243.00	4098.19	253.56 S	2.71 E	-253.57	1.48
4202.00	2.24	271.58	4184.14	254.15 S	0.23 W	-254.15	1.25
4287.00	1.83	279.77	4269.08	253.88 S	3.23 W	-253.86	0.59
4373.00	1.93	270.04	4355.04	253.64 S	6.03 W	-253.61	0.39
4459.00	1.17	289.75	4441.01	253.34 S	8.30 W	-253.30	1.06



4545.00	1.02	35.36	4527.00	252.42 S	8.69 W	-252.38	2.03
4631.00	1.19	20.97	4612.98	250.97 S	7.93 W	-250.93	0.38
4717.00	1.18	16.59	4698.96	249.29 S	7.35 W	-249.25	0.11
4802.00	1.38	10.44	4783.94	247.44 S	6.92 W	-247.41	0.29
5060.00	0.83	323.99	5041.90	242.86 S	7.46 W	-242.83	0.39
5317.00	0.39	231.42	5298.89	241.90 S	9.24 W	-241.86	0.36
5574.00	1.68	221.08	5555.84	245.28 S	12.40 W	-245.23	0.50
5830.00	1.69	217.41	5811.73	251.10 S	17.15 W	-251.02	0.04
5915.00	1.94	165.53	5896.69	253.49 S	17.55 W	-253.41	1.89
6001.00	1.83	156.82	5982.64	256.17 S	16.64 W	-256.09	0.36
6086.00	1.73	153.66	6067.60	258.56 S	15.54 W	-258.49	0.17
6172.00	0.83	142.13	6153.58	260.21 S	14.58 W	-260.15	1.08
6428.00	0.28	129.44	6409.57	262.07 S	12.96 W	-262.01	0.22
6685.00	0.04	20.45	6666.57	262.39 S	12.44 W	-262.33	0.12
6797.00	0.18	301.57	6778.57	262.25 S	12.57 W	-262.20	0.16
6833.00	0.07	207.69	6814.57	262.24 S	12.63 W	-262.19	0.55
6876.00	3.20	354.20	6857.54	261.07 S	12.76 W	-261.02	7.57
6919.00	8.52	1.95	6900.31	256.69 S	12.77 W	-256.64	12.49
6962.00	14.65	3.97	6942.41	248.08 S	12.29 W	-248.02	14.27
7004.00	19.81	4.64	6982.51	235.68 S	11.35 W	-235.63	12.31
7047.00	22.79	5.87	7022.57	220.12 S	9.90 W	-220.08	7.00
7090.00	26.01	7.69	7061.72	202.49 S	7.79 W	-202.45	7.69
7133.00	31.07	4.53	7099.49	182.07 S	5.65 W	-182.04	12.28
7175.00	36.58	3.73	7134.36	158.76 S	3.98 W	-158.74	13.16
7218.00	41.92	2.75	7167.65	131.60 S	2.46 W	-131.59	12.49
7261.00	47.09	1.35	7198.31	101.49 S	1.40 W	-101.49	12.24
7304.00	51.78	0.76	7226.27	68.84 S	0.80 W	-68.84	10.95
7346.00	54.82	2.20	7251.36	35.19 S	0.07 E	-35.19	7.74
7389.00	58.04	1.93	7275.14	0.61 N	1.36 E	0.61	7.51
7432.00	60.16	1.66	7297.22	37.49 N	2.51 E	37.48	4.95
7475.00	62.97	1.91	7317.69	75.28 N	3.69 E	75.26	6.56
7517.00	66.21	1.13	7335.71	113.20 N	4.70 E	113.18	7.89
7559.00	68.31	0.58	7351.95	151.93 N	5.27 E	151.90	5.15
7603.00	69.08	359.55	7367.94	192.92 N	5.31 E	192.89	2.79
7645.00	71.33	0.43	7382.16	232.43 N	5.31 E	232.41	5.71
7688.00	76.04	0.67	7394.24	273.69 N	5.70 E	273.66	10.97
7729.00	82.68	1.28	7401.81	313.95 N	6.39 E	313.92	16.25
7860.00	86.54	358.58	7414.11	444.34 N	6.22 E	444.30	3.59
7946.00	88.33	359.46	7417.96	530.23 N	4.75 E	530.21	2.32
8032.00	90.25	358.30	7419.03	616.20 N	3.07 E	616.19	2.61
8117.00	92.23	358.83	7417.19	701.15 N	0.94 E	701.14	2.41
8203.00	92.10	358.11	7413.95	787.06 N	1.35 W	787.06	0.85
8289.00	91.98	357.55	7410.89	872.95 N	4.60 W	872.96	0.67
8374.00	91.92	357.21	7408.00	957.81 N	8.48 W	957.83	0.42
8460.00	91.61	357.16	7405.35	1043.66 N	12.71 W	1043.71	0.37
8545.00	91.98	357.74	7402.70	1128.54 N	16.49 W	1128.60	0.82
8631.00	91.48	357.18	7400.10	1214.41 N	20.30 W	1214.49	0.87
8717.00	91.11	359.17	7398.15	1300.34 N	23.03 W	1300.43	2.35
8803.00	91.42	357.67	7396.25	1386.29 N	25.40 W	1386.38	1.78
8888.00	90.62	0.29	7394.74	1471.25 N	26.92 W	1471.35	3.22
8974.00	90.25	359.13	7394.09	1557.25 N	27.35 W	1557.35	1.42
9060.00	90.49	358.52	7393.53	1643.23 N	29.12 W	1643.34	0.76
9146.00	91.05	356.89	7392.37	1729.14 N	32.56 W	1729.27	2.01
9232.00	89.07	357.72	7392.28	1815.04 N	36.61 W	1815.19	2.50
9317.00	88.52	0.79	7394.07	1900.01 N	37.71 W	1900.15	3.67
9403.00	88.95	1.01	7395.97	1985.98 N	36.36 W	1986.12	0.57
9489.00	88.08	359.92	7398.19	2071.94 N	35.66 W	2072.08	1.62
9575.00	87.47	359.22	7401.53	2157.87 N	36.31 W	2158.01	1.08
9660.00	88.76	359.54	7404.33	2242.82 N	37.22 W	2242.96	1.57
9746.00	90.99	359.30	7404.51	2328.81 N	38.09 W	2328.96	2.60
9832.00	93.03	359.50	7401.50	2414.75 N	38.98 W	2414.90	2.38
9918.00	91.61	358.52	7398.03	2500.66 N	40.46 W	2500.82	2.01
10003.00	92.22	358.45	7395.18	2585.59 N	42.71 W	2585.75	0.73
10089.00	93.09	358.24	7391.20	2671.46 N	45.20 W	2671.63	1.04
10175.00	93.33	358.97	7386.38	2757.29 N	47.29 W	2757.47	0.89
10260.00	92.53	358.02	7382.03	2842.15 N	49.52 W	2842.34	1.46
10346.00	91.36	358.03	7379.11	2928.05 N	52.48 W	2928.25	1.36
10432.00	94.21	359.10	7374.93	3013.91 N	54.64 W	3014.12	3.54
10517.00	95.20	359.98	7367.96	3098.62 N	55.32 W	3098.83	1.55
10603.00	93.71	0.18	7361.29	3184.36 N	55.20 W	3184.57	1.75
10689.00	93.40	0.72	7355.96	3270.19 N	54.53 W	3270.40	0.72
10775.00	91.85	1.46	7352.02	3356.08 N	52.90 W	3356.28	1.99
10860.00	90.86	2.39	7350.00	3441.01 N	50.05 W	3441.19	1.60
10946.00	91.36	1.70	7348.34	3526.94 N	46.98 W	3527.11	0.98
11032.00	90.93	0.91	7346.62	3612.90 N	45.01 W	3613.06	1.05



11032.00	90.93	0.31	7340.02	3812.90 N	43.07 W	3813.00	1.03
11118.00	91.36	0.38	7344.91	3698.87 N	44.04 W	3699.03	0.80
11203.00	91.85	359.41	7342.53	3783.84 N	44.20 W	3783.99	1.27
11289.00	90.74	359.25	7340.59	3869.81 N	45.20 W	3869.97	1.30
11375.00	90.80	358.36	7339.43	3955.78 N	47.00 W	3955.95	1.04
11461.00	90.62	358.91	7338.36	4041.75 N	49.04 W	4041.93	0.68
11546.00	90.43	358.12	7337.58	4126.72 N	51.24 W	4126.90	0.96
11632.00	89.01	358.75	7338.00	4212.68 N	53.60 W	4212.88	1.81
11718.00	88.77	0.23	7339.67	4298.66 N	54.36 W	4298.86	1.75
11803.00	87.90	359.24	7342.15	4383.62 N	54.75 W	4383.82	1.54
11860.00	87.65	359.09	7344.36	4440.57 N	55.58 W	4440.77	0.50
11910.00	87.65	359.09	7346.41	4490.52 N	56.37 W	4490.73	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 359.75 DEGREES (TRUE)  
A TOTAL CORRECTION OF 8.57 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11910.00 FEET  
IS 4490.88 FEET ALONG 359.28 DEGREES (TRUE)**

**Directional Surveys Tied on to Surface Casing@ 1001'. Final survey is a straight line projection to bit.**