

PCGK: Pressure Case Gamma
PCDC: Pressure Case Directional

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	16-Oct-14	18-Oct-14			
Rig Bit Number	2	3			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (TVD, ft)	1,219.99	4,866.95			
Log End Depth (TVD, ft)	4,866.95	5,643.14			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	16-Oct-14 04:30	16-Oct-14 23:10			
Drill/Wipe End Date and Time	16-Oct-14 14:10	16-Oct-14 23:10			
Min Inc (deg) @ Depth (TVD, ft)	0.19 @ 3,996.03	0.56 @ 4,893.95			
Max Inc (deg) @ Depth (TVD, ft)	8.36 @ 2,484.23	81.87 @ 5,637.32			
Bit TFA(in2) / Bit Type	0.74 / PDC	0.86 / PDC			
Flow Rate (gpm)	593.61	541.52			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Fresh Water Gel	Lignosulfanate			
Density (ppg) / Viscosity (spqt)	9.13 / 45.00	10.60 / 41.00			
Filtrate CL (ppm)	150.00	150.00			
pH / Fluid Loss (mptm)	8.90 / 6	8.90 / 7			
PV (cP) / YP (lbf2)	12 / 12.00	14 / 11.00			
% Solids / % Sand	7.10 / 0.05	10.80 / 1.00			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (in F) / S	145.00 / PGM	150.40 / PGM			

Max Tool Temp (degF) / Source	145.90 / PCM	156.13 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Juan Pablo Centeno	Juan Pablo Centeno			
Customer Representative	Dave Nielsen	Dave Nielsen			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11404267	11404267			
Insert Serial Number	11400845	11400845			
Date and Time Initialized	13-Oct-14 10:21	13-Oct-14 10:21			
Date and Time Read	18-Oct-14 08:15	18-Oct-14 08:21			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	53.91	53.01			
Software Version	6.21	6.21			
Sub Serial Number	11404267	11404267			
Sonde Serial Number	11062073	11062073			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	58.84	336.67			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	48.81	47.91			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11404267	11404267			
Insert/Sonde Serial Number	11579773	11579773			

REMARKS

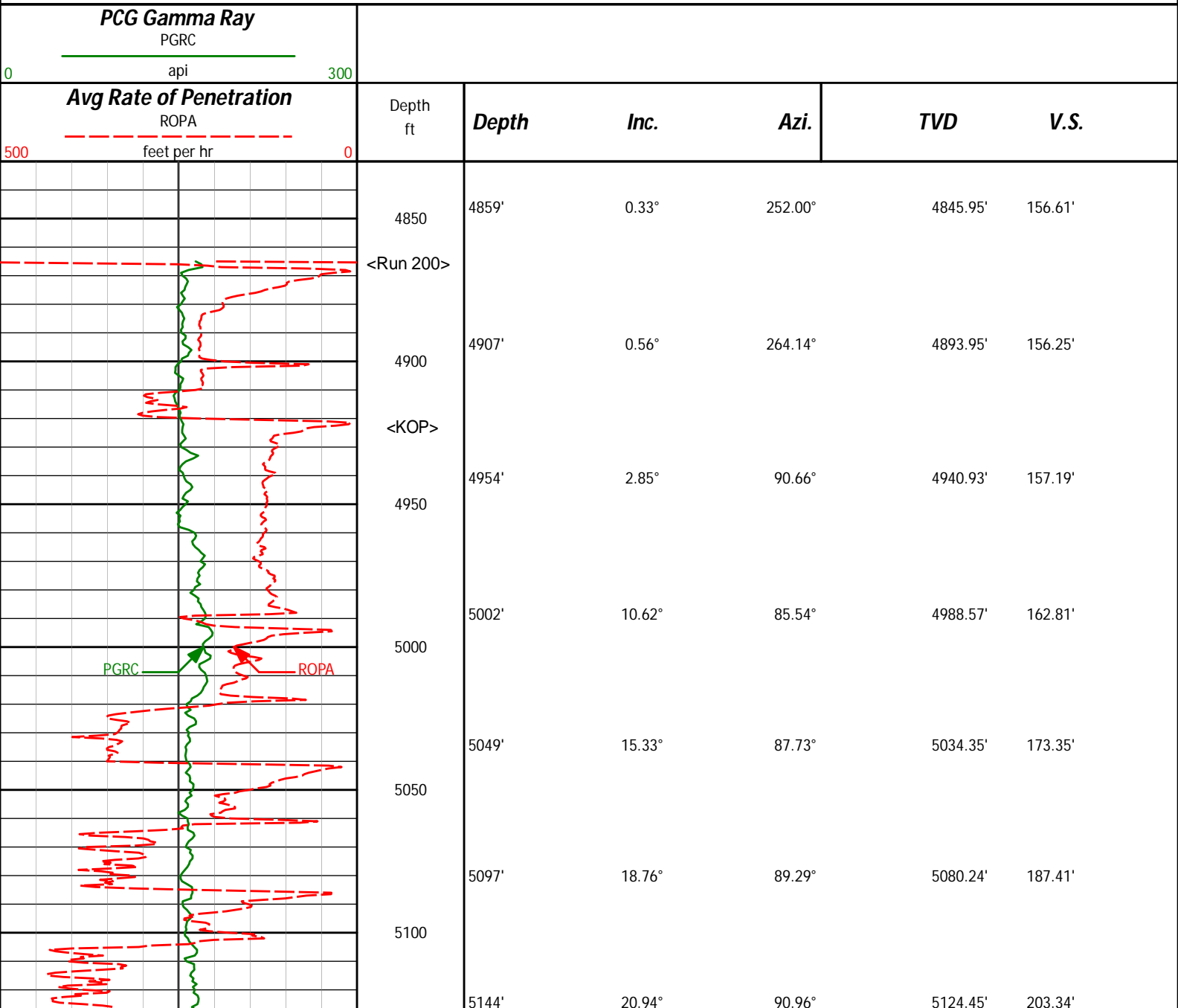
1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
 - 2" (1:600) log - 1 ft. interval, 3 ft. coercion distance, 5 ft. gap fill.
 - 5" (1:240) log for ROP - 0.5 ft. interval, 1.2 ft. coercion distance, 3 ft. gap fill.
 - 5" (1:240) log for Gamma Ray - 0.5 ft. interval, 0.6 ft. coercion distance, 3 ft. gap fill.
5. INSITE version 8.0.20

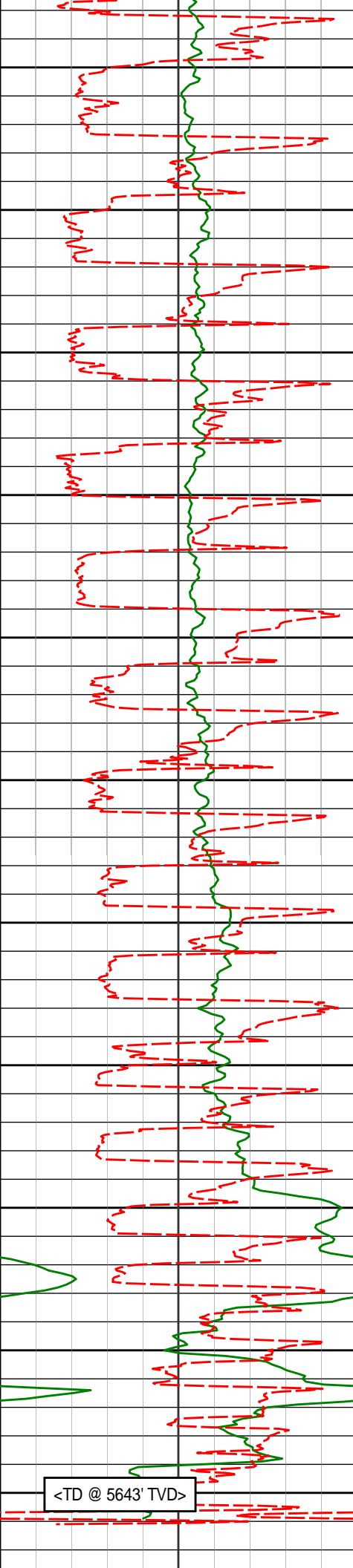
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HALLIBURTON
Sperry Drilling Services
TVD Detail Log 1:600

Noble Energy, Inc
Rohn State LD10-63-1HN
H&P 273
T9N R58W





5150

5192'	22.92°	89.83°	5168.97'	221.23'
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5200

5239'	25.87°	90.76°	5211.77'	240.61'
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5250

5287'	29.23°	91.48°	5254.32'	262.74'
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5300

5334'	32.54°	91.01°	5294.65'	286.79'
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5350

5382'	35.44°	90.21°	5334.45'	313.56'
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5400

5429'	38.77°	90.71°	5371.93'	341.86'
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5450

5477'	42.80°	90.46°	5408.26'	373.14'
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5500

5523'	46.64°	90.18°	5440.94'	405.44'
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5550

5571'	49.76°	89.22°	5472.93'	441.18'
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5600

5618'	52.45°	88.91°	5502.44'	477.73'
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5650

5666'	56.77°	89.28°	5530.23'	516.82'
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5713'	61.33°	89.97°	5554.39'	557.07'
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5761'	65.71°	89.55°	5575.79'	599.97'
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5808'	68.27°	88.28°	5594.16'	643.20'
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5856'	70.49°	87.38°	5611.06'	688.12'
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5903'	74.67°	87.01°	5625.13'	732.95'
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5963'	81.87°	87.51°	5637.32'	791.66'
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6086'	85.96°	88.03°	5647.90'	914.15'
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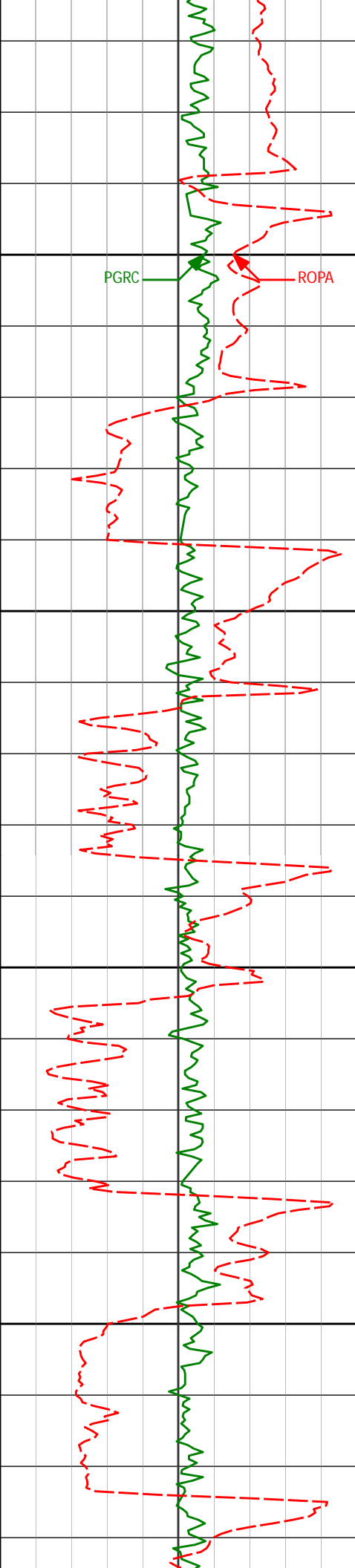
6179'	85.90°	88.15°	5654.51'	1006.89'
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6272'	87.44°	88.22°	5658.91'	1088.60'
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6365'	88.00°	88.00°	5660.00'	1088.00'
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<TD @ 5643' TVD>

<div><div>Avg Rate of Penetration</div><div>ROPAPercentage of ROP: 0%</div><div>feet per hr</div></div>		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
5000							
<div><div>PCG Gamma Ray</div><div>PGRC</div><div>api</div></div>							
0300							
<div><div>HALLIBURTON</div><div>Sperry Drilling Services</div><div>TVD Detail Log 1:240</div><div>Noble Energy, Inc. Rohn State LD10-63-1HN H&P 273 T9N R58W</div></div>							
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5000							



5000

5002'

10.62°

85.54°

4988.57'

162.81'

5049'

15.33°

87.73°

5034.35'

173.35'

5050

5097'

18.76°

89.29°

5080.24'

187.41'

5100

5144'

20.94°

90.96°

5124.45'

203.34'

5150

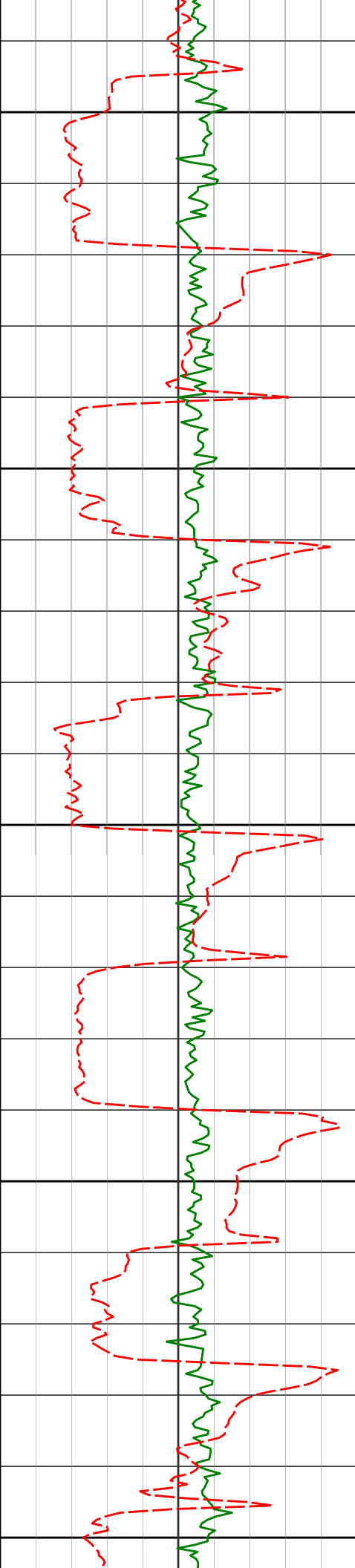
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221.23'



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240.61'

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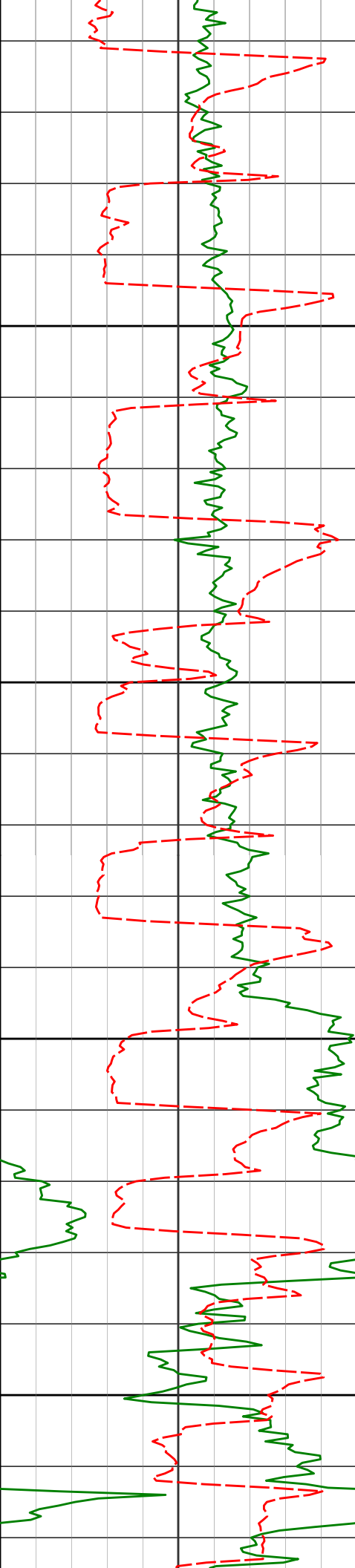
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38.77°

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341.86'



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	5523'	46.64°	90.18°	5440.94'	405.44'
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	5761'	65.71°	89.55°	5575.79'	599.97'
	5808'	68.27°	88.28°	5594.16'	643.20'
5600					
	5856'	70.49°	87.38°	5611.06'	688.12'

4293.00	0.39	136.07	4280.03	150.28 N	155.86 E	163.84	0.12
4388.00	0.57	177.42	4375.03	149.58 N	156.11 E	164.04	0.40
4483.00	1.20	242.60	4470.02	148.65 N	155.25 E	163.13	1.15
4578.00	1.34	255.57	4564.99	147.92 N	153.29 E	161.14	0.33
4673.00	1.07	259.90	4659.97	147.48 N	151.34 E	159.17	0.29
4767.00	0.89	279.04	4753.96	147.44 N	149.75 E	157.58	0.40
4824.00	0.55	266.49	4810.95	147.50 N	149.05 E	156.88	0.66
4859.00	0.33	252.00	4845.95	147.45 N	148.79 E	156.61	0.68
4907.00	0.56	264.14	4893.95	147.39 N	148.42 E	156.25	0.50
4954.00	2.85	90.66	4940.93	147.35 N	149.36 E	157.19	7.24
5002.00	10.62	85.54	4988.57	147.68 N	154.97 E	162.81	16.21
5049.00	15.33	87.73	5034.35	148.26 N	165.50 E	173.35	10.08
5097.00	18.76	89.29	5080.24	148.61 N	179.56 E	187.41	7.20
5144.00	20.94	90.96	5124.45	148.56 N	195.52 E	203.34	4.79
5192.00	22.92	89.83	5168.97	148.45 N	213.44 E	221.23	4.24
5239.00	25.87	90.76	5211.77	148.34 N	232.85 E	240.61	6.33
5287.00	29.23	91.48	5254.32	147.90 N	255.05 E	262.74	7.03
5334.00	32.54	91.01	5294.65	147.38 N	279.16 E	286.79	7.05
5382.00	35.44	90.21	5334.45	147.10 N	305.99 E	313.56	6.12
5429.00	38.77	90.71	5371.93	146.87 N	334.34 E	341.86	7.11
5477.00	42.80	90.46	5408.26	146.55 N	365.68 E	373.14	8.41
5523.00	46.64	90.18	5440.94	146.37 N	398.05 E	405.44	8.35
5571.00	49.76	89.22	5472.93	146.56 N	433.82 E	441.18	6.67
5618.00	52.45	88.91	5502.44	147.16 N	470.39 E	477.73	5.75
5666.00	56.77	89.28	5530.23	147.78 N	509.51 E	516.82	9.02
5713.00	61.33	89.97	5554.39	148.04 N	549.81 E	557.07	9.77
5761.00	65.71	89.55	5575.79	148.22 N	592.76 E	599.97	9.17
5808.00	68.27	88.28	5594.16	149.04 N	636.01 E	643.20	5.99
5856.00	70.49	87.38	5611.06	150.75 N	680.90 E	688.12	4.94
5903.00	74.67	87.01	5625.13	152.95 N	725.68 E	732.95	8.93
5963.00	81.87	87.51	5637.32	155.75 N	784.32 E	791.66	12.02
6018.00	86.00	88.00	5643.14	157.88 N	838.96 E	846.33	7.57

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 86.87 DEGREES (GRID)
A TOTAL CORRECTION OF 6.98 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6018.00 FEET
IS 853.69 FEET ALONG 79.34 DEGREES (GRID)**

Surface surveys at 375 ft, 745 ft, and 1208 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 5963 ft MD to TD at 6018 ft MD.