



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100				
Date run completed	30-Apr-15				
Rig Bit Number	2				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.750				
Log Start Depth (TVD, ft)	691.97				
Log End Depth (TVD, ft)	5,945.74				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	29-Apr-15 02:55				
Drill/Wipe End Date and Time	29-Apr-15 20:10				
Min Inc (deg) @ Depth (TVD, ft)	0.06 @ 1,570.92				
Max Inc (deg) @ Depth (TVD, ft)	83.77 @ 5,940.92				
Bit TFA(in2) / Bit Type	0.98 /				
Flow Rate (gpm)	575.65				
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A				
Fluid Type	Fresh Water Gel				
Density (ppg) / Viscosity (spqt)	10.20 / 47.00				
Filtrate CL (ppm)	1,200.00				
pH / Fluid Loss (mptm)	9.00 / 10				
PV (cP) / YP (lhf2)	12 / 10.00				
% Solids / % Sand	5.10 / 0.50				
% Oil / Oil:Water Ratio	N/A / N/A				
Rm @ Measured Temp (degF)	N/A @ N/A				
Rmf @ Measured Temp (degF)	N/A @ N/A				
Rmc @ Measured Temp (degF)	N/A @ N/A				

Max Tool Temp (degF) / Source	171.20 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Paul Kock				
Customer Representative	Dave Neilson				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	246473				
Insert Serial Number	11400838				
Date and Time Initialized	28-Apr-15 07:18				
Date and Time Read	30-Apr-15 00:42				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	54.00				
Software Version	6.33				
Sub Serial Number	246473				
Sonde Serial Number	11638623				
Sensor ID Number	N/A				
Toolface Offset (deg)	304.50				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	41.66				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	246473				
Insert/Sonde Serial Number	12071280				

REMARKS

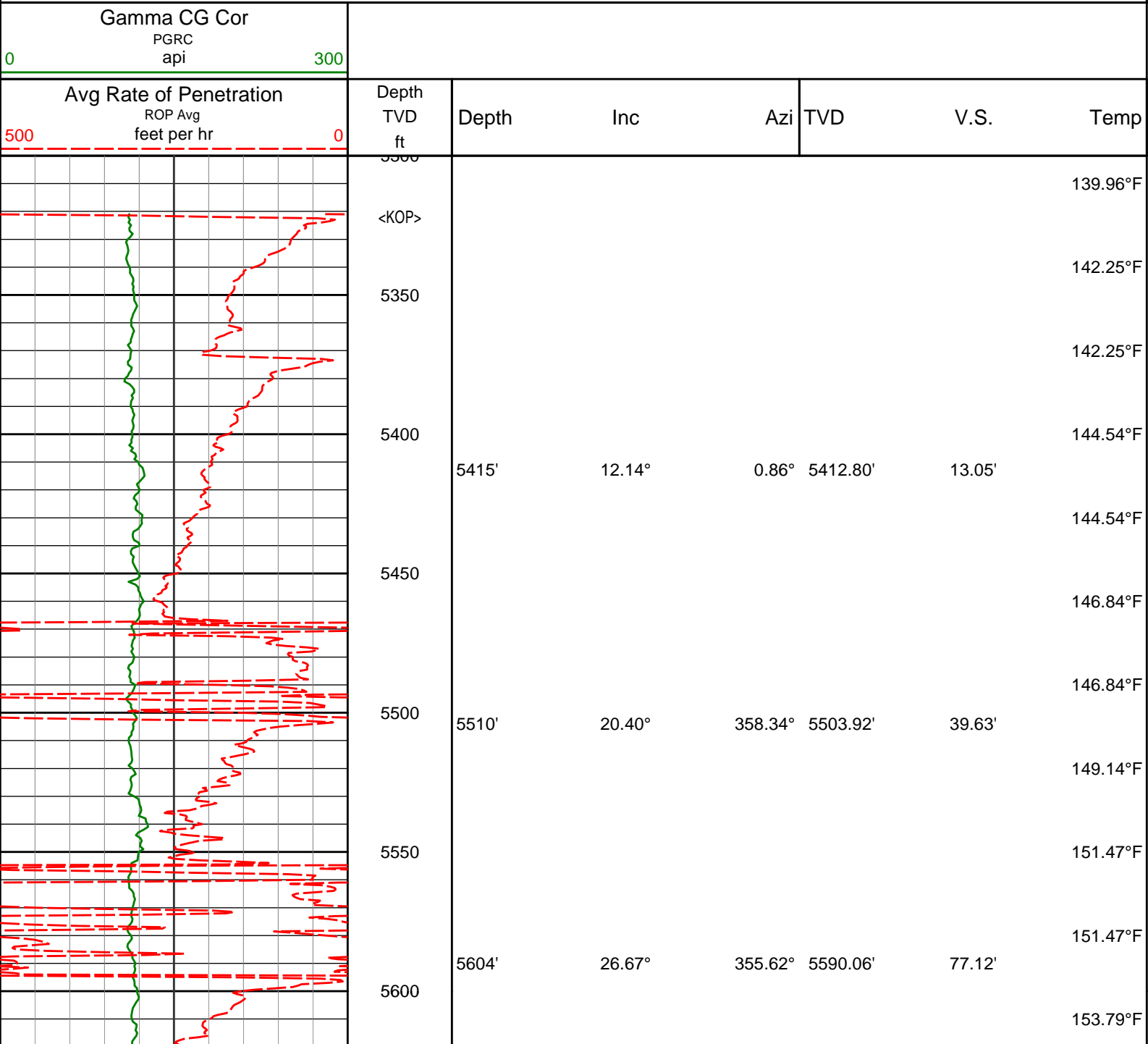
1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
 - All ROP in logs - 0.5 ft interval, 1.2 ft coercion distance.
 - Gamma in 2" (1:600) logs - 1 ft interval, 3 ft coercion distance.
 - Gamma in 5" (1:240) logs - 0.5 ft interval, 0.6 ft coercion distance.
5. INSITE version 8.1.10.

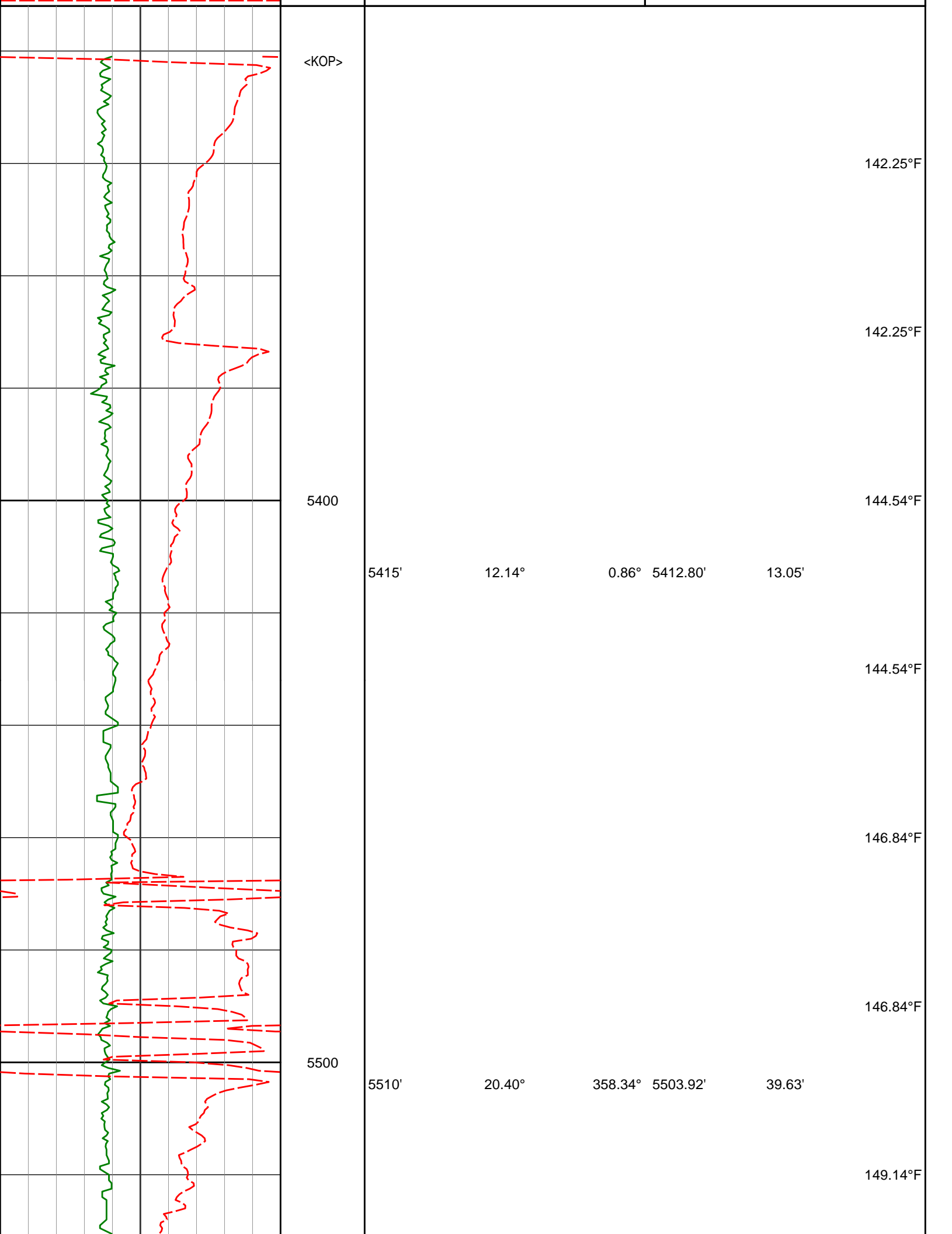
WARRANTY

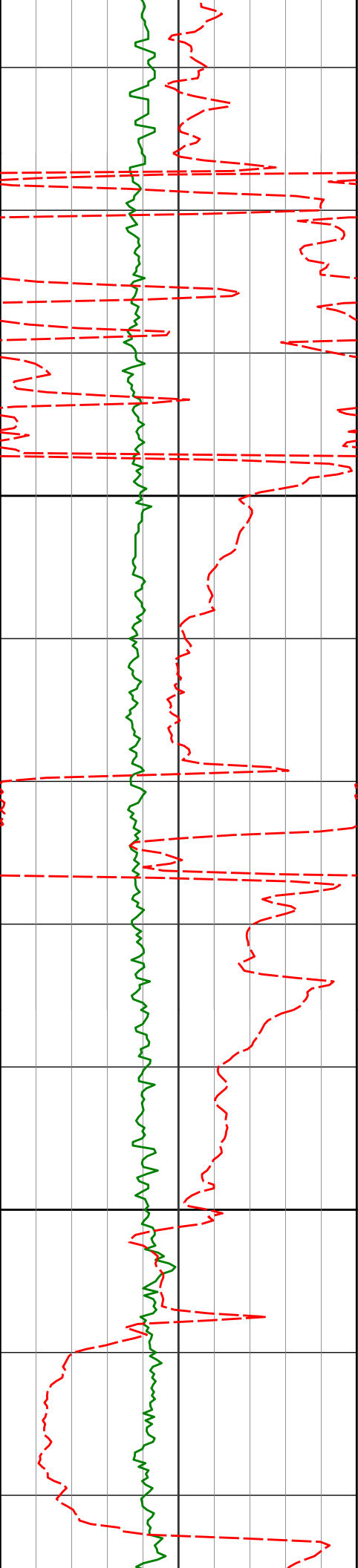
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TVD Detail 1:600 Scale







5600

5700

5604'

5699'

5794'

26.67°

35.95°

43.91°

355.62°

359.00°

1.10°

5590.06'

5671.15'

5743.94'

77.12'

126.41'

187.29'

151.47°F

151.47°F

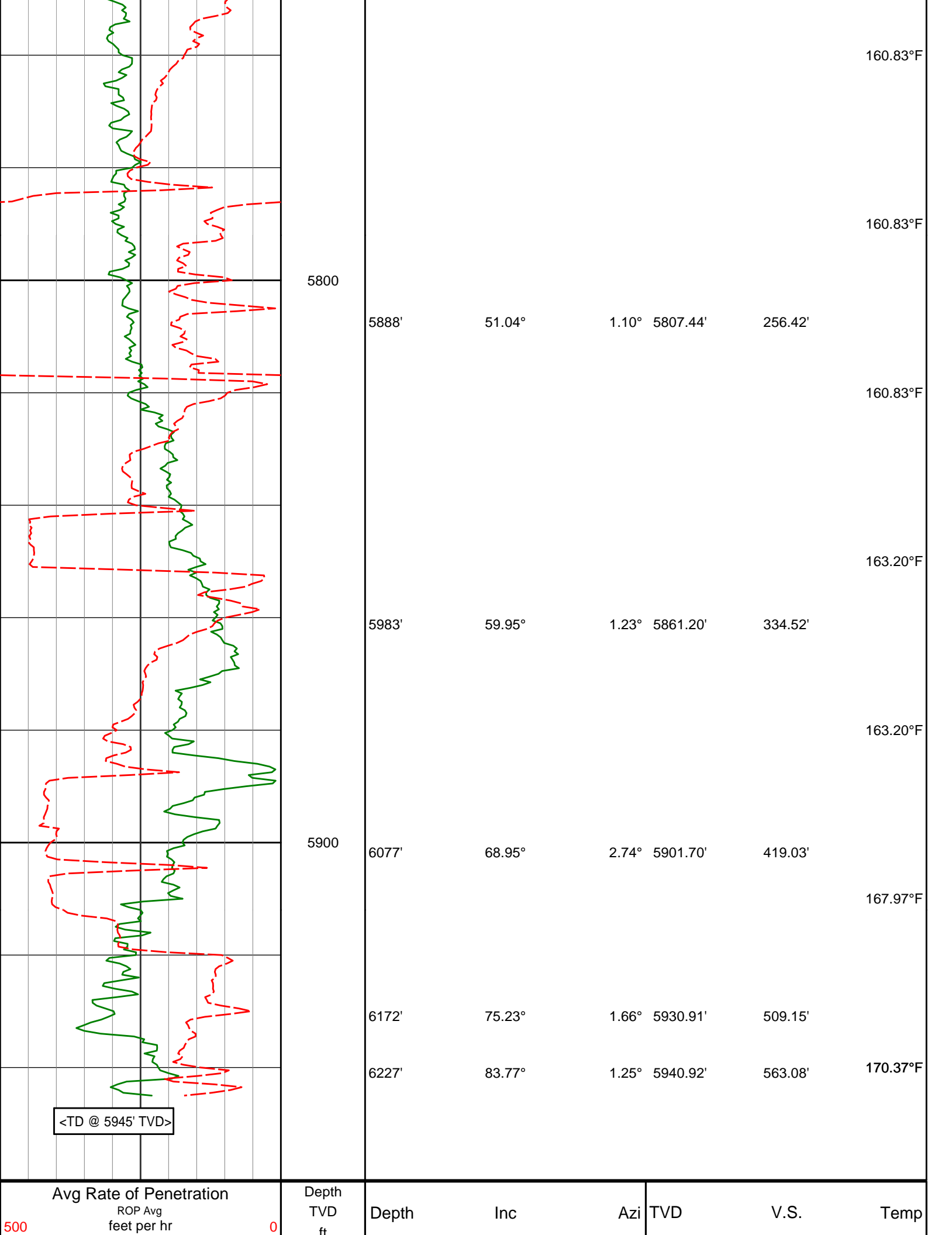
153.79°F

156.13°F

156.13°F

158.47°F

160.83°F



<TD @ 5945' TVD>

Avg Rate of Penetration		Depth				TVD	V.S.	Temp
500	ROP Avg feet per hr	TVD ft	Depth	Inc	Azi	TVD	V.S.	Temp

Gamma Ray Cor PGRC api	300
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HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Gleason LC26-720
Wattenberg
Weld Colorado
USA
CA-XX-0902230128

<i>Measured Depth (feet)</i>	<i>Inclination (degrees)</i>	<i>Direction (degrees)</i>	<i>Vertical Depth (feet)</i>	<i>Latitude (feet)</i>	<i>Departure (feet)</i>	<i>Vertical Section (feet)</i>	<i>Dogleg (deg/100ft)</i>
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
250.00	0.33	148.09	250.00	0.61 S	0.38 E	-0.62	0.13
500.00	0.66	148.09	499.99	2.44 S	1.52 E	-2.49	0.13
729.00	0.96	148.09	728.97	5.20 S	3.24 E	-5.30	0.13
824.00	0.65	152.60	823.96	6.36 S	3.91 E	-6.48	0.33
920.00	0.57	177.04	919.95	7.32 S	4.18 E	-7.45	0.28
1109.00	0.57	182.25	1108.94	9.19 S	4.20 E	-9.32	0.03
1386.00	0.74	190.71	1385.92	12.31 S	3.81 E	-12.43	0.07
1479.00	0.30	334.63	1478.92	12.68 S	3.59 E	-12.79	1.08
1571.00	0.06	45.51	1570.92	12.42 S	3.52 E	-12.54	0.32
1664.00	0.09	302.27	1663.92	12.35 S	3.49 E	-12.46	0.13
1756.00	0.43	4.63	1755.92	11.97 S	3.46 E	-12.08	0.43
1847.00	0.56	3.04	1846.92	11.18 S	3.51 E	-11.30	0.15
2125.00	0.83	33.21	2124.90	8.14 S	4.68 E	-8.30	0.16
2218.00	0.80	11.07	2217.89	6.94 S	5.18 E	-7.11	0.34
2401.00	1.09	9.83	2400.86	3.97 S	5.72 E	-4.16	0.16
2494.00	1.04	18.12	2493.85	2.30 S	6.13 E	-2.50	0.18
2587.00	1.27	21.92	2586.83	0.55 S	6.78 E	-0.77	0.26
2679.00	1.24	15.74	2678.81	1.35 N	7.43 E	1.10	0.15
2866.00	1.87	322.69	2865.74	5.73 N	6.12 E	5.52	0.80
2960.00	1.71	320.90	2959.70	8.04 N	4.31 E	7.89	0.18
3054.00	1.52	319.67	3053.66	10.09 N	2.61 E	9.99	0.20
3148.00	1.60	305.39	3147.63	11.80 N	0.73 E	11.77	0.42
3243.00	1.25	305.21	3242.60	13.16 N	1.19 W	13.20	0.36
3338.00	1.31	314.24	3337.57	14.52 N	2.82 W	14.61	0.22
3432.00	1.52	313.86	3431.54	16.14 N	4.49 W	16.28	0.22
3527.00	1.59	310.83	3526.51	17.87 N	6.40 W	18.08	0.11
3622.00	0.91	249.44	3621.49	18.47 N	8.10 W	18.73	1.47
3716.00	0.88	255.38	3715.48	18.02 N	9.49 W	18.33	0.10
3810.00	0.84	249.85	3809.47	17.60 N	10.84 W	17.96	0.10
3906.00	0.75	249.53	3905.46	17.14 N	12.08 W	17.54	0.10
4000.00	1.12	231.33	3999.45	16.36 N	13.37 W	16.80	0.50
4094.00	1.46	222.39	4093.42	14.90 N	14.90 W	15.39	0.42
4188.00	1.68	223.60	4187.39	13.02 N	16.65 W	13.57	0.23
4283.00	1.51	213.41	4282.35	10.96 N	18.30 W	11.57	0.35
4377.00	1.55	202.49	4376.32	8.76 N	19.47 W	9.41	0.31
4471.00	1.69	185.97	4470.28	6.21 N	20.10 W	6.88	0.52
4566.00	1.68	176.04	4565.24	3.43 N	20.15 W	4.10	0.31
4661.00	1.38	165.00	4660.21	0.94 N	19.76 W	1.60	0.44
4755.00	1.27	154.81	4754.18	1.09 S	19.02 W	-0.45	0.27
4850.00	0.80	142.85	4849.17	2.57 S	18.17 W	-1.96	0.54
5132.00	0.59	146.30	5131.14	5.36 S	16.17 W	-4.81	0.08
5226.00	0.68	171.54	5225.14	6.31 S	15.82 W	-5.78	0.31
5415.00	12.14	0.86	5412.80	12.54 N	15.35 W	13.05	6.78
5510.00	20.40	358.34	5503.92	39.12 N	15.68 W	39.63	8.72
5604.00	26.67	355.62	5590.06	76.56 N	17.77 W	77.12	6.77
5699.00	35.95	359.00	5671.15	125.81 N	19.89 W	126.41	9.94
5794.00	43.91	1.10	5743.94	186.73 N	19.75 W	187.29	8.50
5888.00	51.04	1.10	5807.44	255.95 N	18.42 W	256.42	7.59
5983.00	59.95	1.23	5861.20	334.14 N	16.82 W	334.52	9.38

6077.00	68.95	2.74	5901.70	418.80 N	13.85 W	419.03	9.68
6172.00	75.23	1.66	5930.91	509.08 N	10.39 W	509.15	6.71
6227.00	83.77	1.25	5940.92	563.10 N	9.02 W	563.08	15.53
6281.00	86.00	1.25	5945.74	616.86 N	7.84 W	616.78	4.14

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 358.07 DEGREES (GRID)
A TOTAL CORRECTION OF 7.01 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6281.00 FEET
IS 616.91 FEET ALONG 359.27 DEGREES (GRID)**

Surveys at 250 ft and 500 ft were interpolated from first survey at 729 ft per Noble Energy.

Last survey is a projection from 6227 ft MD to TD at 6281 ft MD.

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