



1 : 600 / 1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100				
Date run completed	25-Oct-15				
Rig Bit Number	2				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.750				
Log Start Depth (MD, ft)	815.00				
Log End Depth (MD, ft)	7,387.00				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	23-Oct-15 19:00				
Drill/Wipe End Date and Time	25-Oct-15 04:00				
Min Inc (deg) @ Depth (MD, ft)	0.07 @ 916.00				
Max Inc (deg) @ Depth (MD, ft)	80.97 @ 7,331.00				
Bit TFA(in2) / Bit Type	0.98 / PDC				
Flow Rate (gpm)	591.27				
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A				
Fluid Type	Fresh Water Gel				
Density (ppg) / Viscosity (spqt)	10.20 / 35.00				
Filtrate CL (ppm)	1,300.00				
pH / Fluid Loss (mptm)	9.40 / 0				
PV (cP) / YP (lhf2)	10 / 10.00				
% Solids / % Sand	9.7 / .15				
% 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	183.90 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Paul Kock				
Customer Representative	Charles Colville				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	11619287				
Insert Serial Number	11227560				
Date and Time Initialized	22-Oct-15 18:42				
Date and Time Read	25-Oct-15 10:04				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	56.00				
Software Version	6.21				
Sub Serial Number	11619287				
Sonde Serial Number	11638521				
Sensor ID Number	N/A				
Toolface Offset (deg)	283.90				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	43.71				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	11619287				
Insert/Sonde Serial Number	11579781				

REMARKS

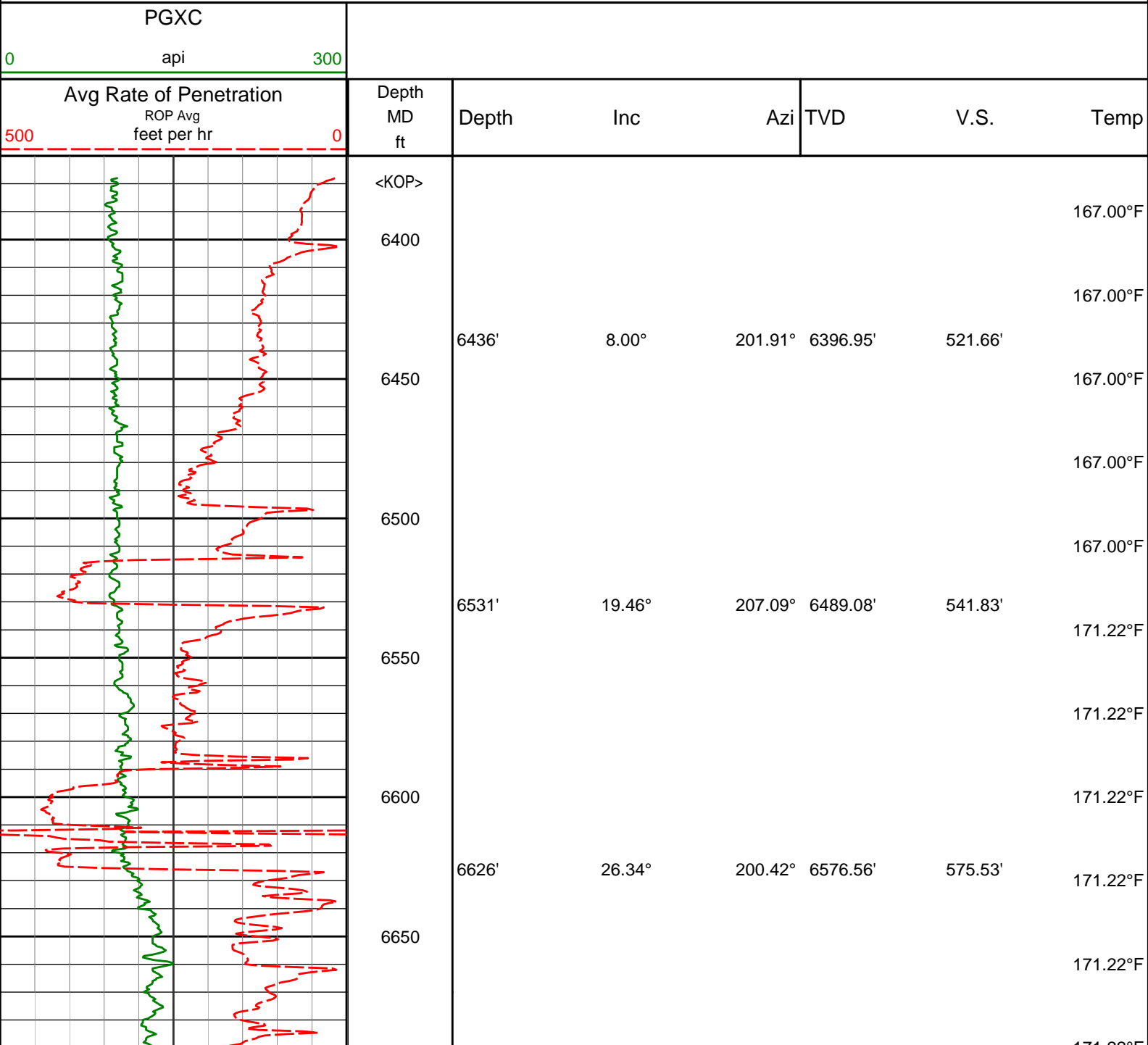
1. All depths are calibrated to the driller's pipe tally and are measured from the rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - 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 8.3.0

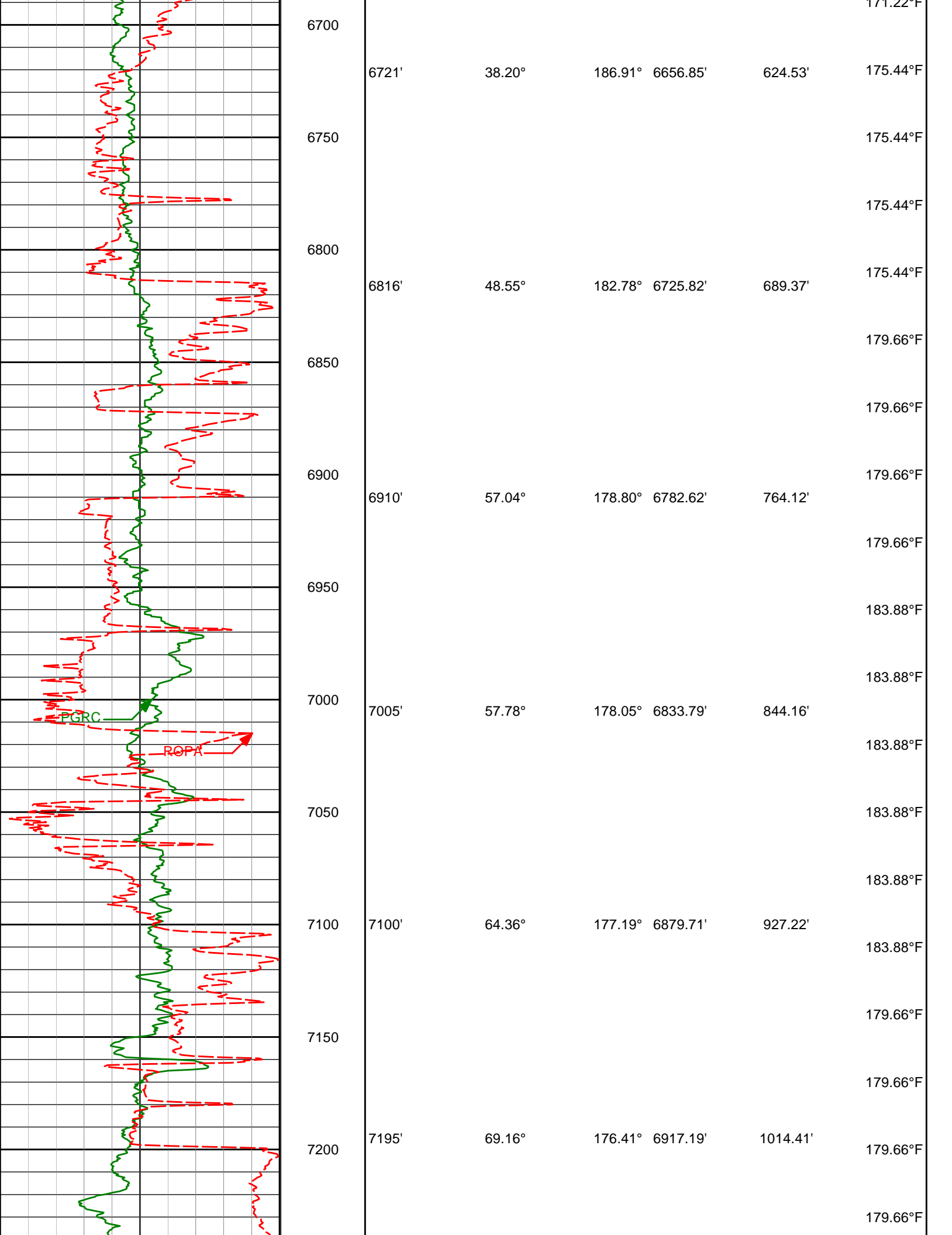
WARRANTY

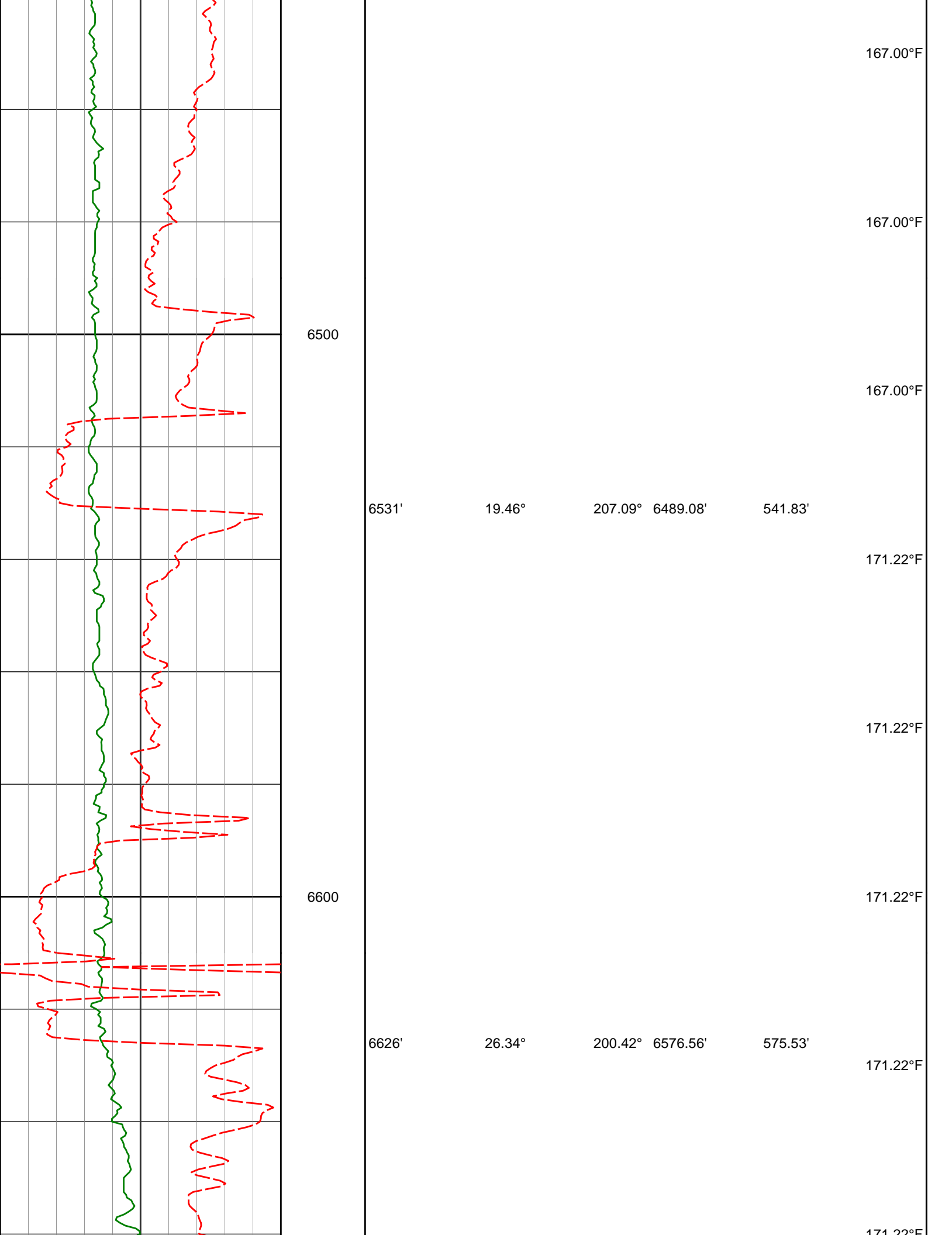
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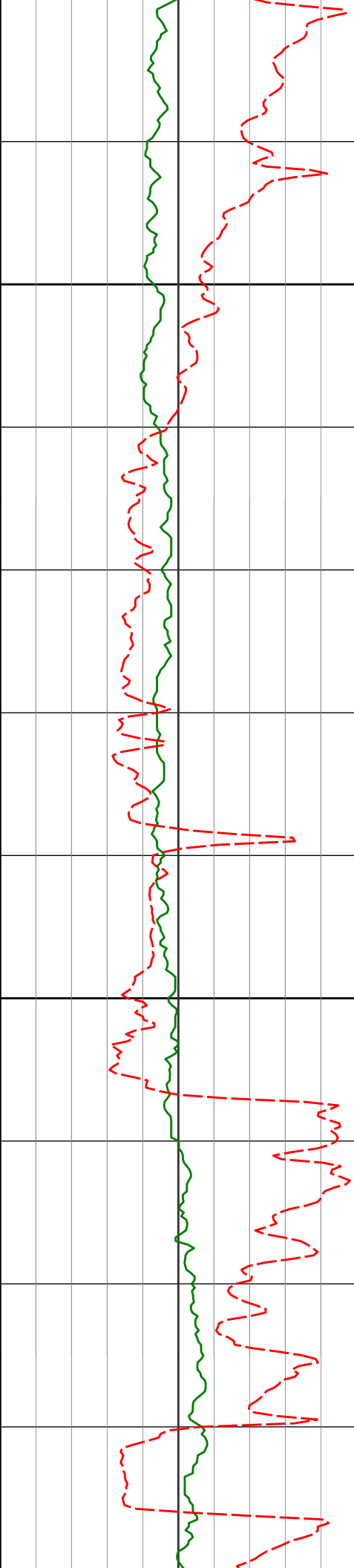
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MD Detail 1:600 Scale









6700

<Run 200>

6800

6721'

38.20°

186.91°

6656.85'

624.53'

175.44°F

175.44°F

175.44°F

6816'

48.55°

182.78°

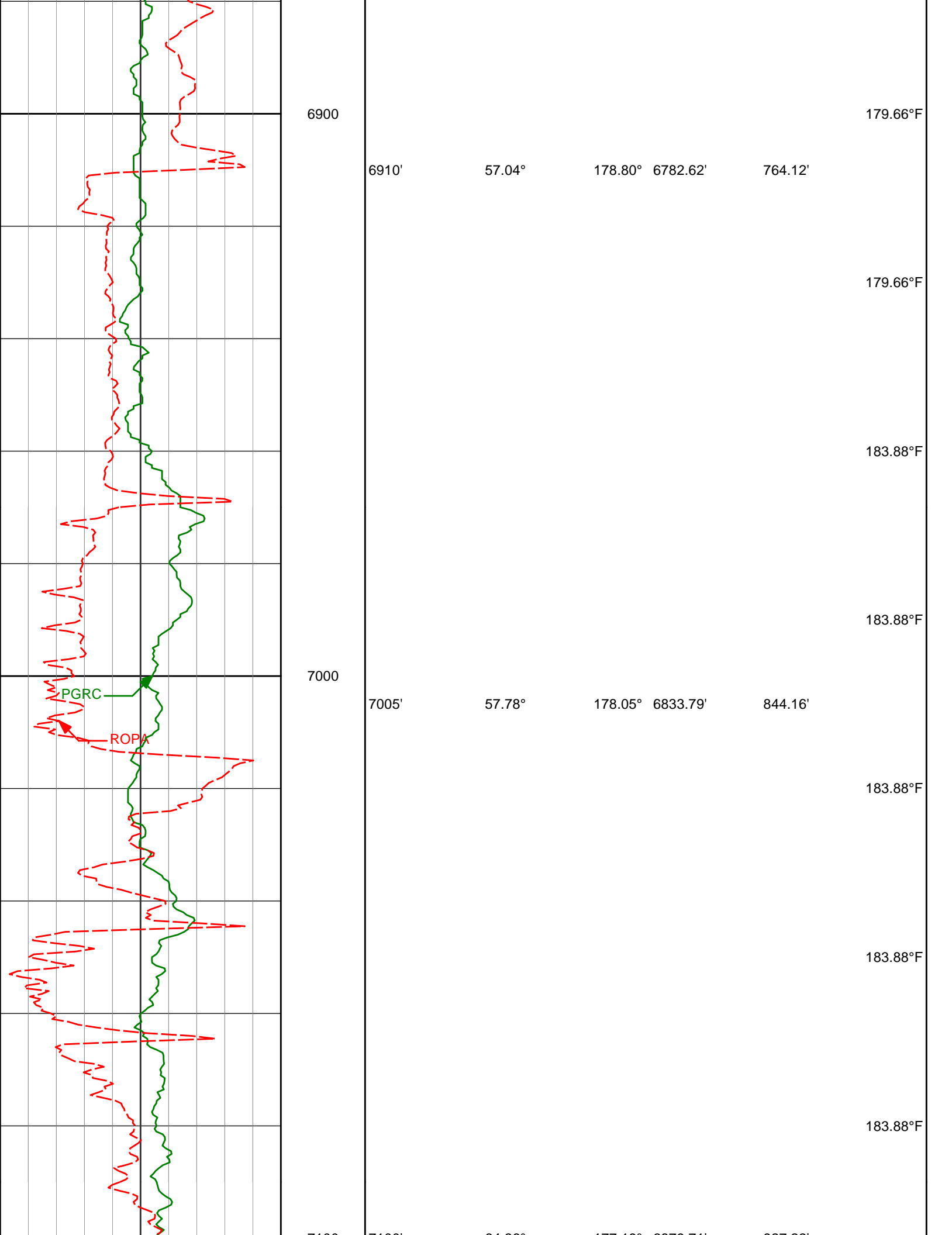
6725.82'

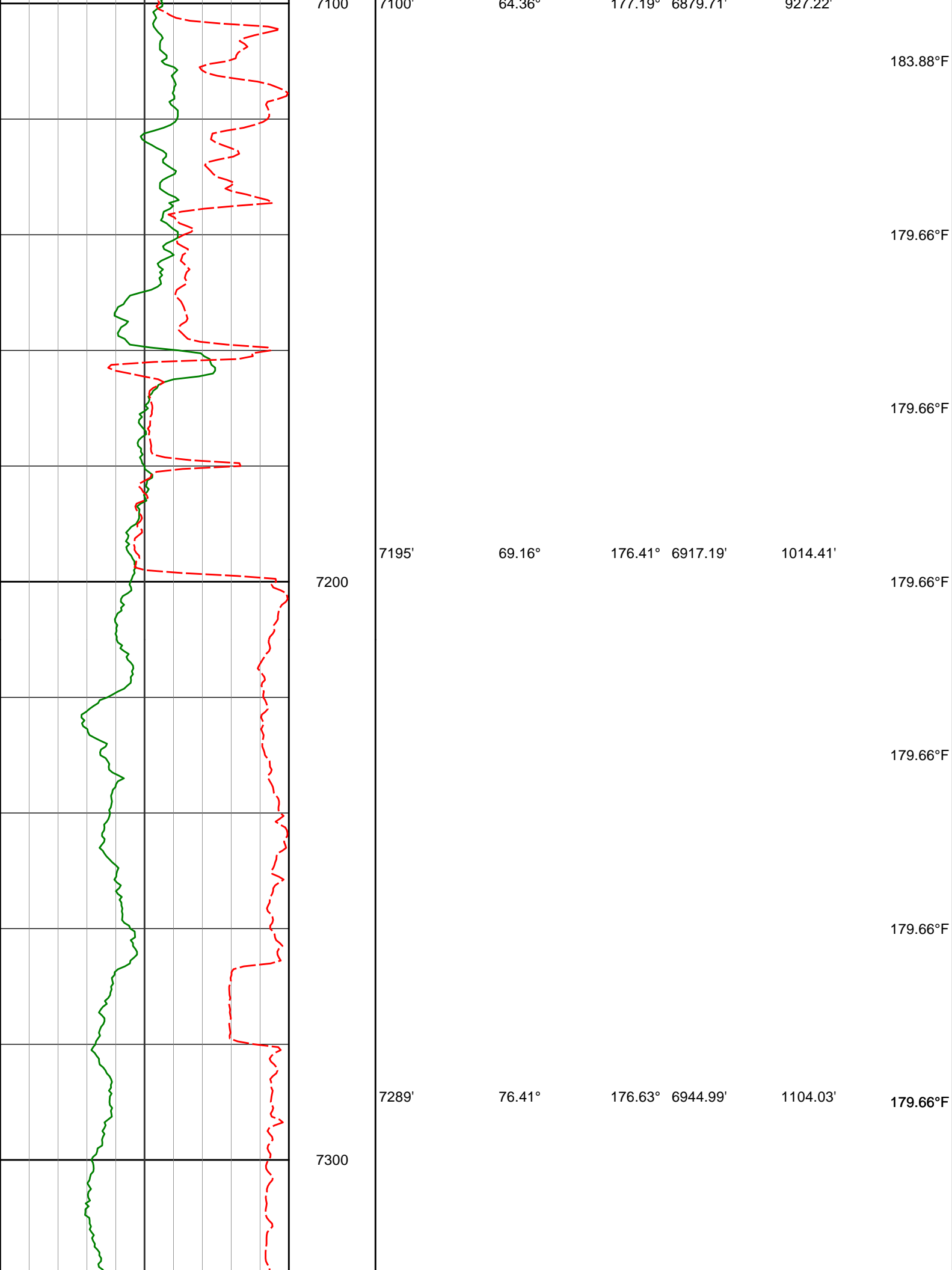
689.37'

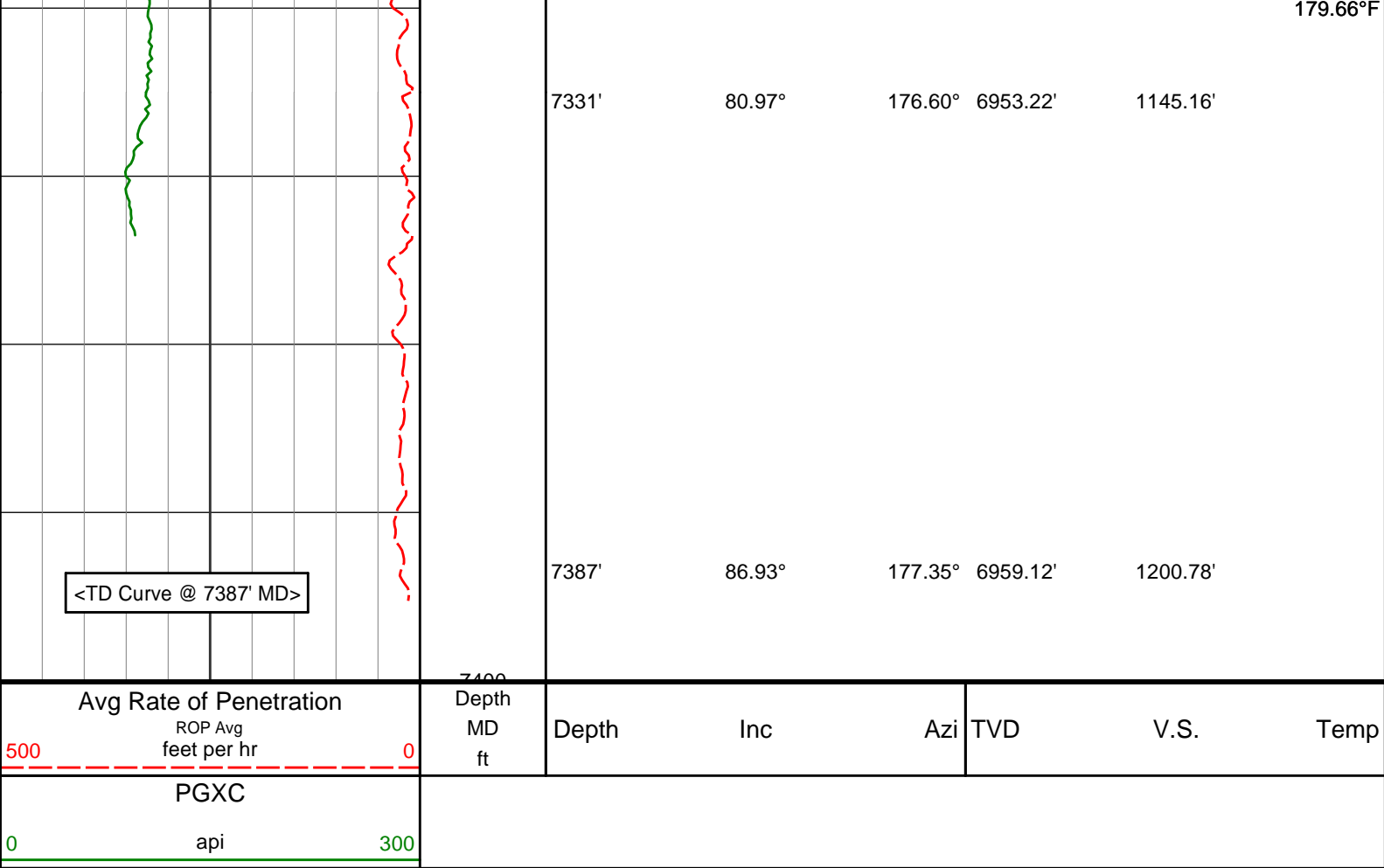
175.44°F

179.66°F

179.66°F







DIRECTIONAL SURVEY REPORT

Noble Energy
Moser H34-769
Wattenberg
Weld Colorado
USA
CA-XX-0902771571

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
250.00	0.03	320.92	250.00	0.05 N	0.04 W	-0.05	0.01
500.00	0.07	320.92	500.00	0.22 N	0.18 W	-0.22	0.02
815.00	0.11	320.92	815.00	0.60 N	0.49 W	-0.61	0.01
821.00	0.11	320.92	821.00	0.61 N	0.50 W	-0.62	0.02
916.00	0.07	209.14	916.00	0.63 N	0.58 W	-0.64	0.16
1010.00	0.79	268.61	1010.00	0.57 N	1.26 W	-0.59	0.81
1105.00	1.01	261.75	1104.98	0.43 N	2.74 W	-0.47	0.26
1197.00	1.77	162.57	1196.97	1.04 S	3.12 W	1.00	2.36
1289.00	1.89	160.45	1288.92	3.82 S	2.18 W	3.80	0.14
1472.00	1.71	162.98	1471.83	9.28 S	0.37 W	9.28	0.10
1564.00	3.61	181.26	1563.73	13.50 S	0.04 W	13.49	2.24
1656.00	5.28	177.14	1655.45	20.63 S	0.11 E	20.63	1.85
1747.00	7.01	188.99	1745.92	30.30 S	0.55 W	30.29	2.35
1839.00	9.88	188.49	1836.92	43.66 S	2.59 W	43.62	3.12
1930.00	9.12	186.61	1926.67	58.54 S	4.57 W	58.48	0.90
2021.00	11.09	184.80	2016.25	74.43 S	6.13 W	74.35	2.19
2113.00	10.42	184.54	2106.64	91.54 S	7.53 W	91.44	0.73
2205.00	9.53	185.37	2197.24	107.42 S	8.90 W	107.29	0.98
2296.00	9.36	181.76	2287.01	122.31 S	9.84 W	122.18	0.68
2388.00	10.72	175.71	2377.60	138.33 S	9.43 W	138.20	1.87
2480.00	10.08	174.39	2468.09	154.88 S	8.00 W	154.76	0.75
2662.00	8.60	173.94	2647.67	184.25 S	5.00 W	184.17	0.81

2753.00	9.91	186.64	2737.50	198.80 S	5.19 W	198.72	2.66
2845.00	10.02	187.09	2828.11	214.60 S	7.10 W	214.49	0.14
2936.00	9.88	186.12	2917.74	230.22 S	8.90 W	230.08	0.24
3030.00	9.50	185.90	3010.40	245.96 S	10.56 W	245.80	0.40
3125.00	8.01	185.59	3104.29	260.34 S	12.01 W	260.17	1.58
3314.00	7.86	187.28	3291.48	286.26 S	14.93 W	286.04	0.15
3408.00	8.94	177.10	3384.48	299.92 S	15.37 W	299.70	1.95
3503.00	7.39	171.08	3478.51	313.33 S	14.05 W	313.12	1.86
3597.00	7.94	175.27	3571.67	325.77 S	12.58 W	325.59	0.83
3692.00	8.05	180.42	3665.75	338.96 S	12.09 W	338.78	0.76
3787.00	8.24	181.46	3759.79	352.42 S	12.31 W	352.23	0.26
3881.00	9.56	167.77	3852.67	366.79 S	10.83 W	366.62	2.65
3976.00	8.99	166.42	3946.43	381.71 S	7.42 W	381.59	0.65
4071.00	8.57	166.41	4040.31	395.81 S	4.01 W	395.73	0.44
4165.00	9.86	164.79	4133.10	410.39 S	0.25 W	410.35	1.40
4260.00	8.93	161.61	4226.82	425.24 S	4.21 E	425.26	1.12
4355.00	9.50	169.77	4320.60	439.96 S	7.93 E	440.02	1.50
4449.00	8.24	165.12	4413.47	454.11 S	11.04 E	454.21	1.54
4544.00	8.11	169.49	4507.51	467.28 S	14.01 E	467.42	0.67
4639.00	7.20	180.84	4601.66	479.83 S	15.15 E	479.98	1.85
4733.00	4.38	173.35	4695.18	489.29 S	15.48 E	489.45	3.10
4828.00	3.95	175.64	4789.93	496.15 S	16.15 E	496.32	0.49
4922.00	2.85	177.95	4883.76	501.72 S	16.48 E	501.89	1.17
5017.00	2.72	172.53	4978.65	506.32 S	16.85 E	506.49	0.31
5112.00	2.47	170.48	5073.55	510.57 S	17.48 E	510.75	0.28
5206.00	2.31	169.83	5167.47	514.44 S	18.15 E	514.62	0.17
5396.00	0.84	75.85	5357.41	517.87 S	20.18 E	518.09	1.32
5490.00	1.10	56.72	5451.40	517.21 S	21.61 E	517.44	0.44
5585.00	1.41	50.57	5546.37	515.97 S	23.27 E	516.22	0.35
5680.00	1.60	61.85	5641.34	514.60 S	25.34 E	514.88	0.37
5774.00	1.27	222.23	5735.33	514.75 S	25.80 E	515.04	3.01
5869.00	0.90	190.39	5830.31	516.26 S	24.96 E	516.54	0.73
5964.00	0.74	183.51	5925.30	517.61 S	24.79 E	517.89	0.20
6058.00	0.50	120.25	6019.30	518.43 S	25.10 E	518.70	0.73
6153.00	0.73	74.96	6114.29	518.48 S	26.04 E	518.77	0.54
6247.00	1.93	56.02	6208.27	517.44 S	27.93 E	517.75	1.35
6342.00	1.74	63.23	6303.22	515.89 S	30.54 E	516.24	0.32
6436.00	8.00	201.91	6396.95	521.33 S	29.37 E	521.66	9.98
6531.00	19.46	207.09	6489.08	541.63 S	19.66 E	541.83	12.12
6626.00	26.34	200.42	6576.56	575.51 S	5.08 E	575.53	7.72
6721.00	38.20	186.91	6656.85	624.66 S	5.85 W	624.53	14.55
6816.00	48.55	182.78	6725.82	689.57 S	11.13 W	689.37	11.29
6910.00	57.04	178.80	6782.62	764.34 S	12.01 W	764.12	9.65
7005.00	57.78	178.05	6833.79	844.35 S	9.81 W	844.16	1.03
7100.00	64.36	177.19	6879.71	927.38 S	6.33 W	927.22	6.97
7195.00	69.16	176.41	6917.19	1014.51 S	1.45 W	1014.41	5.11
7289.00	76.41	176.63	6944.99	1104.07 S	3.99 E	1104.03	7.72
7331.00	80.97	176.60	6953.22	1145.17 S	6.42 E	1145.16	10.85
7387.00	86.93	177.35	6959.12	1200.76 S	9.36 E	1200.78	10.73

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 179.27 DEGREES (GRID)
A TOTAL CORRECTION OF 7.91 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7387.00 FEET
IS 1200.80 FEET ALONG 179.55 DEGREES (GRID)**

Surveys at 250 ft, 500 ft and 815 are interpolated between surface and first survey at 821 ft.

Last survey is a projection from 7331 ft MD to TD at 7387 ft MD.