



1:600 / 1:240

WELL INFORMATION					
MWD Run Number	100	200	300		
Date run completed	27-Feb-15	28-Feb-15	28-Feb-15		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	8.750		
Tool Nominal OD (in)	6.750	6.750	6.750		
Log Start Depth (TVD, ft)	950.99	6,382.41	6,576.13		
Log End Depth (TVD, ft)	6,382.41	6,576.13	6,682.38		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	26-Feb-15 12:50	27-Feb-15 17:35	28-Feb-15 10:00		
Drill/Wipe End Date and Time	27-Feb-15 07:20	28-Feb-15 02:10	28-Feb-15 20:00		
Min Inc (deg) @ Depth (TVD, ft)	0.11 @ 1,081.99	30.94 @ 6,417.22	46.27 @ 6,564.62		
Max Inc (deg) @ Depth (TVD, ft)	24.12 @ 6,333.03	42.15 @ 6,530.94	88.49 @ 6,680.95		
Bit TFA(in2) / Bit Type	1.21 / PDC	0.98 / PDC	0.90 / PDC		
Flow Rate (gpm)	595.04	565.62	585.00		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A	N/A / N/A		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.60 / 27.00	10.40 / 38.00	10.80 / 35.00		
Filtrate CL (ppm)	1,100.00	1,200.00	1,200.00		
pH / Fluid Loss (mptm)	8.60 / 0	7.90 / 9	9.20 / 9		
PV (cP) / YP (lhf2)	1 / 9.00	10 / 9.00	9 / 9.00		
% Solids / % Sand	0.50 / 0.10	11.30 / 0.30	11.60 / 0.30		
% Oil / Oil:Water Ratio	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		
Rmf @ Measured Temp (degF)	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		

Max Tool Temp (degF) / Source	145.90 / PCM	150.10 / PCM	167.00 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Lead MWD Engineer	Paul Kock	Paul Kock	Paul Kock		
Customer Representative	Charles Collver	Dave Nielsen	Dave Nielsen		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.93	5.93	5.93		
Sub Serial Number	11107081	11107081	11107081		
Insert Serial Number	11680742	11680742	11680742		
Date and Time Initialized	25-Feb-15 23:56	25-Feb-15 23:56	25-Feb-15 23:56		
Date and Time Read	01-Mar-15 00:52	01-Mar-15 00:52	01-Mar-15 00:52		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	52.62	53.53	51.56		
Software Version	6.33	6.33	6.33		
Sub Serial Number	11107081	11107081	11107081		
Sonde Serial Number	11638559	11638559	11638559		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	226.30	111.80	28.30		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	42.50	43.41	41.44		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11107081	11107081	11107081		
Insert/Sonde Serial Number	11293411	11293411	11293411		

REMARKS

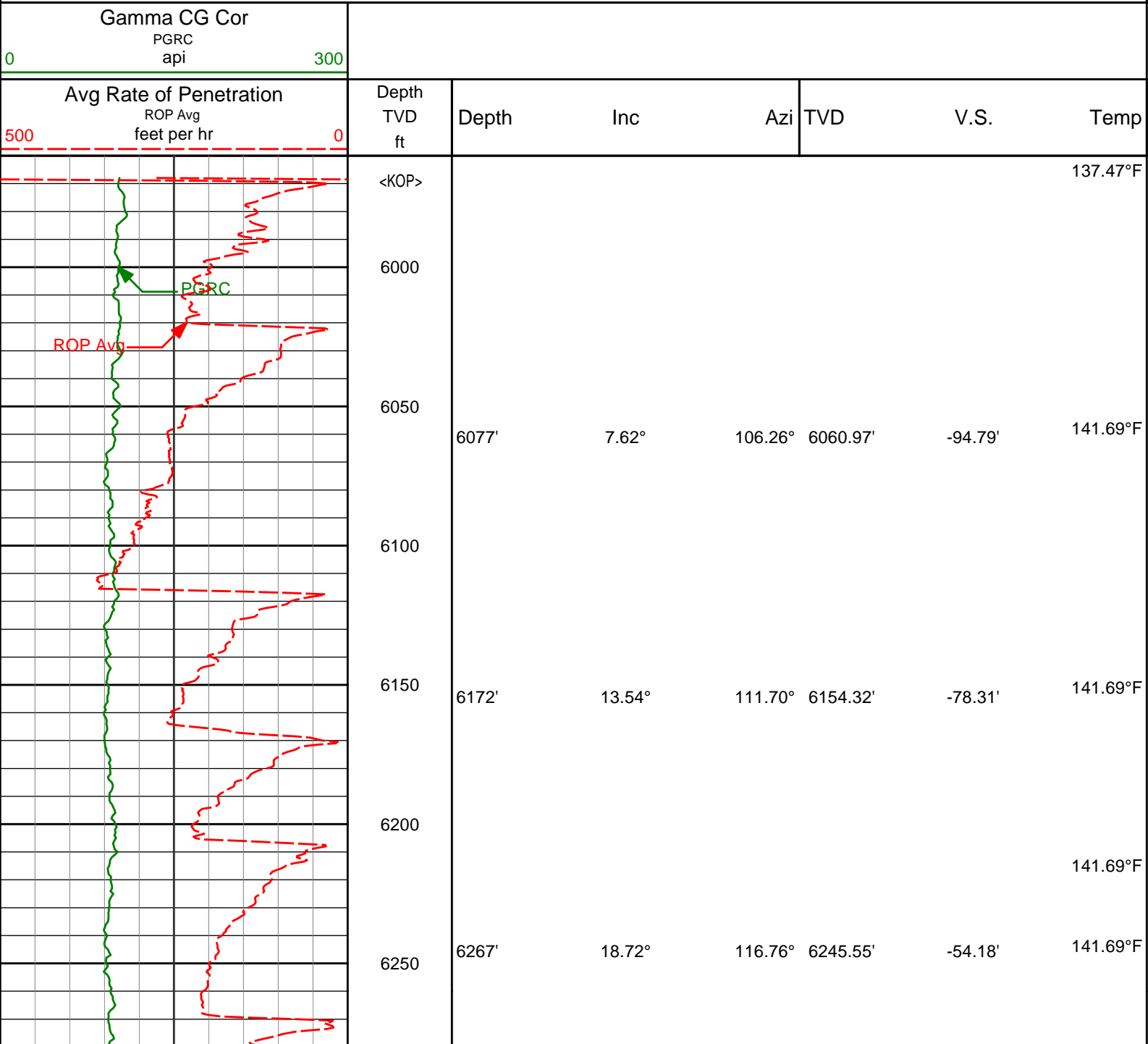
1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.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

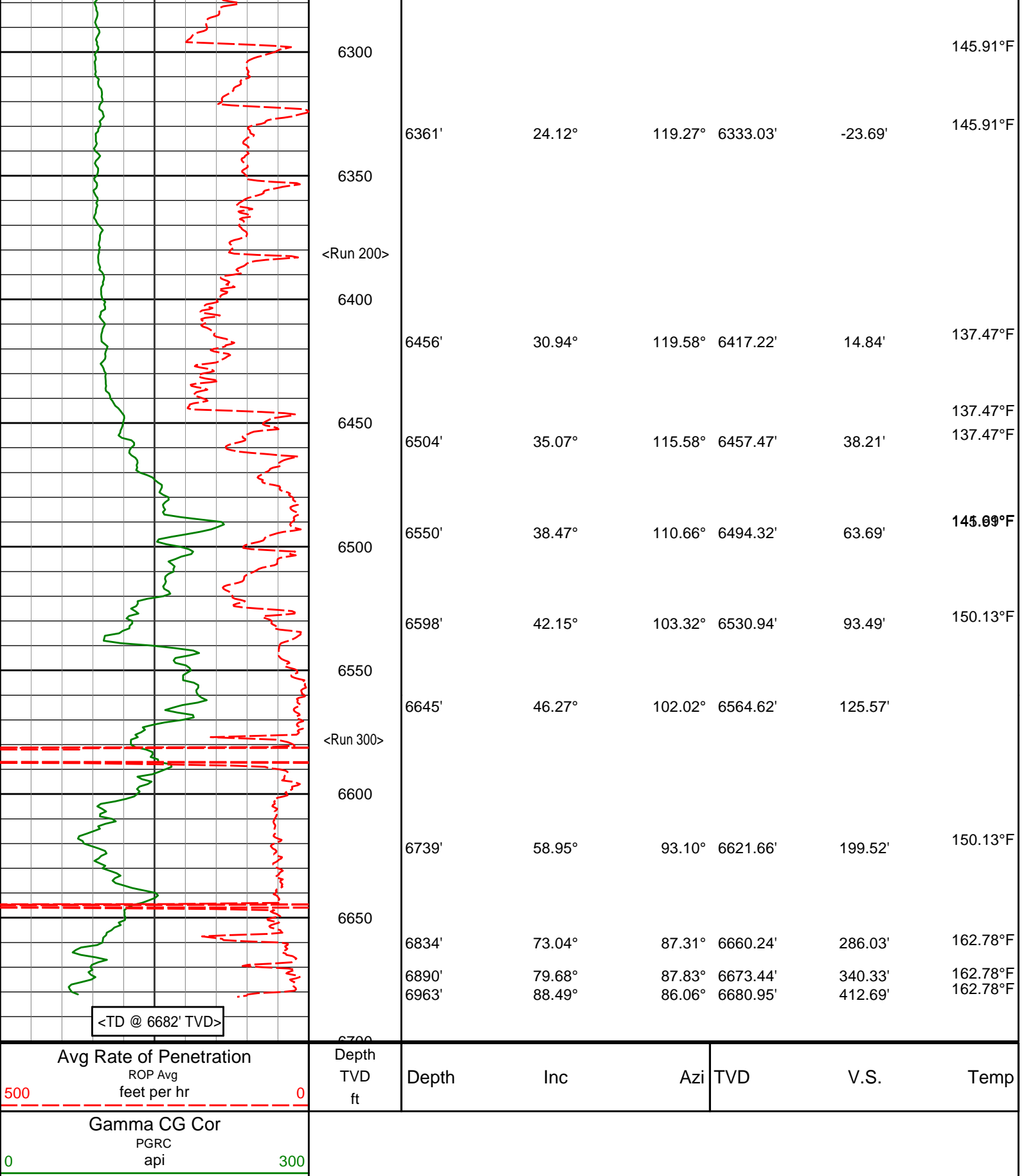
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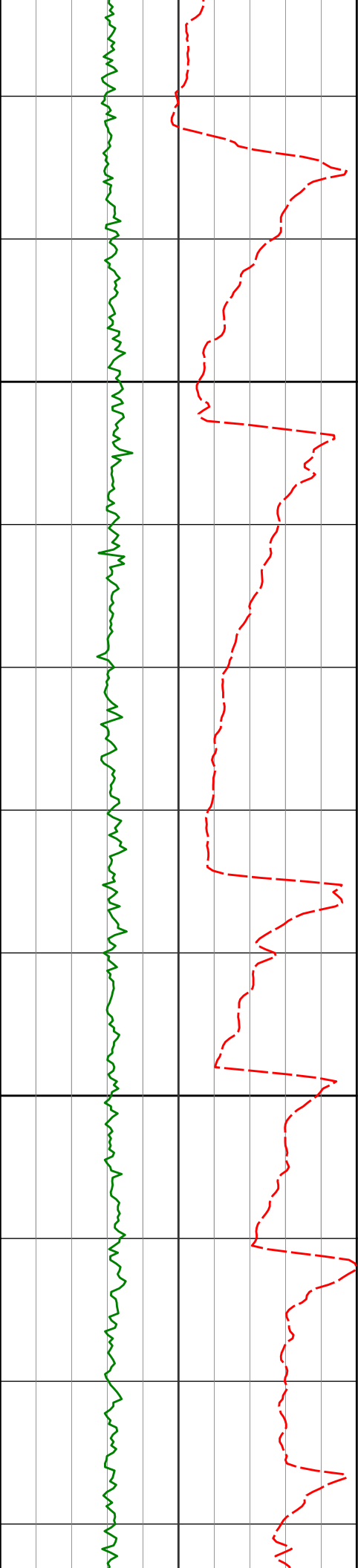
TVD Detail 1:600 Scale





TVD Detail 1:240 Scale

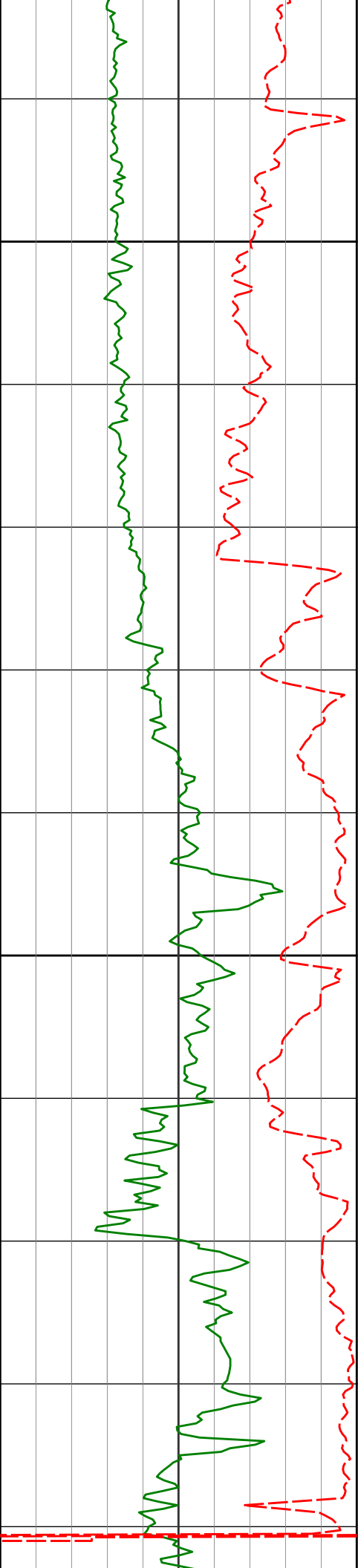
Gamma Ray Cor PGRC api							
Avg Rate of Penetration ROP Avg feet per hr		Depth TVD ft	Inc	Azi	TVD	V.S.	Temp
0	300						137.47°F
500	0	<KOP>					
		6000					
		6077'	7.62°	106.26°	6060.97'	-94.79'	141.69°F
		6100					



6200

6300

6172'	13.54°	111.70°	6154.32'	-78.31'	141.69°F
6267'	18.72°	116.76°	6245.55'	-54.18'	141.69°F
6361'	24.12°	119.27°	6333.03'	-23.69'	145.91°F



<Run 200>

6400

6456'	30.94°	119.58°	6417.22'	14.84'	137.47°F
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					137.47°F
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6504'	35.07°	115.58°	6457.47'	38.21'	137.47°F
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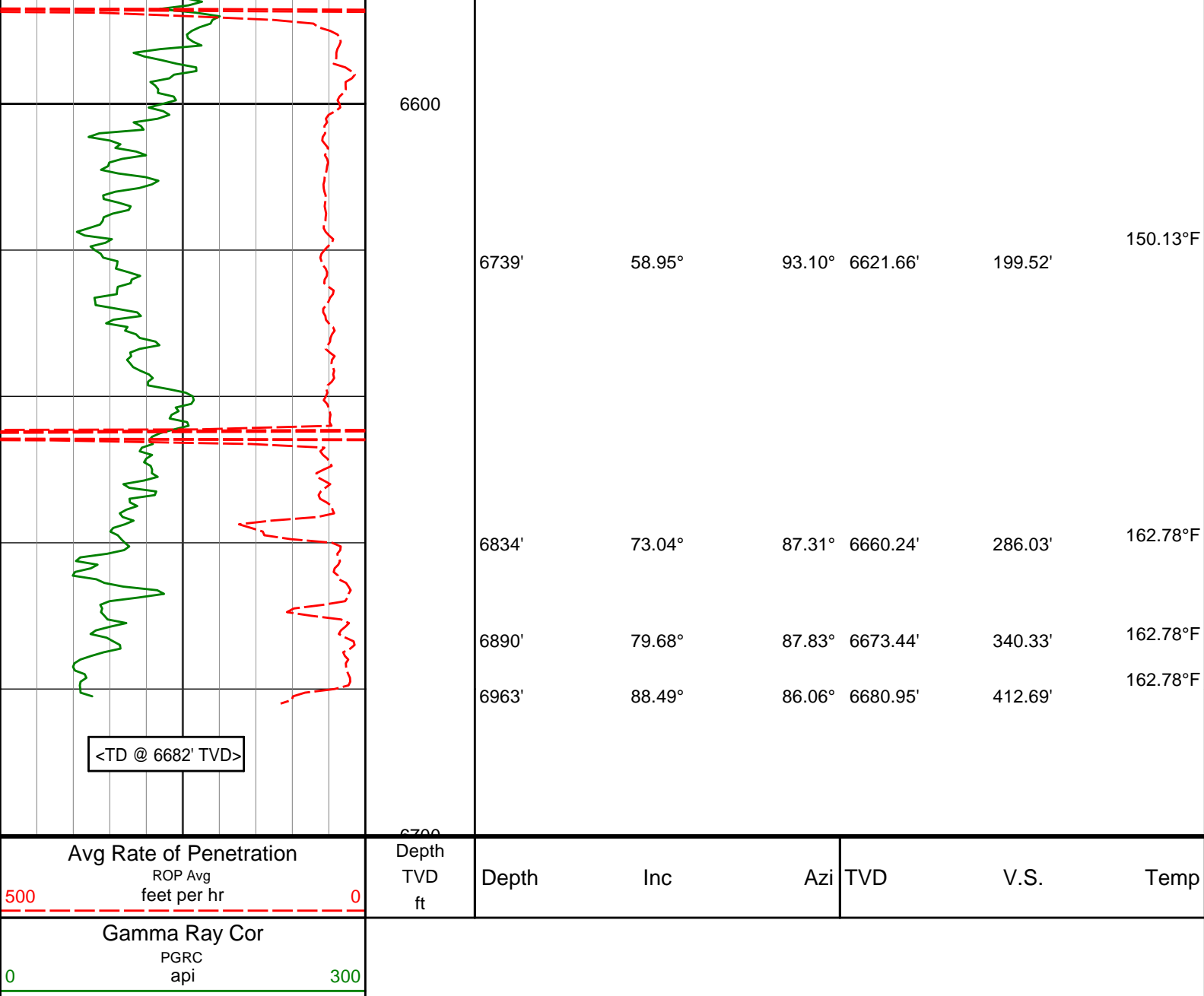
6500

6550'	38.47°	110.66°	6494.32'	63.69'	145.99°F
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6598'	42.15°	103.32°	6530.94'	93.49'	150.13°F
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6645'	46.27°	102.02°	6564.62'	125.57'	
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<Run 300>



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Aggie State AA17-623
Wattenberg
Weld Colorado
USA
CA-XX-0902102301

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
366.00	0.10	137.04	366.00	0.23 S	0.22 E	0.22	0.03
613.00	0.60	329.64	613.00	0.72 N	0.29 W	-0.30	0.28
859.00	0.20	282.04	858.99	1.93 N	1.36 W	-1.39	0.20
1082.00	0.11	204.87	1081.99	1.81 N	1.83 W	-1.86	0.09
1358.00	0.18	196.62	1357.99	1.16 N	2.07 W	-2.08	0.03
1451.00	0.47	234.33	1450.99	0.79 N	2.42 W	-2.43	0.37
1543.00	2.69	228.49	1542.95	0.86 S	4.34 W	-4.33	2.42
1636.00	4.78	213.41	1635.75	5.54 S	8.11 W	-8.02	2.46
1730.00	6.60	209.80	1729.28	13.50 S	12.95 W	-12.74	1.97

1919.00	7.06	204.09	1916.94	33.52 S	23.09 W	-22.58	0.43
2013.00	7.92	209.25	2010.14	44.45 S	28.61 W	-27.93	1.16
2108.00	7.28	206.65	2104.30	55.54 S	34.51 W	-33.66	0.76
2202.00	8.80	214.23	2197.38	66.81 S	41.23 W	-40.21	1.97
2297.00	8.09	216.87	2291.35	78.16 S	49.33 W	-48.13	0.85
2391.00	7.60	216.90	2384.47	88.43 S	57.03 W	-55.68	0.52
2485.00	9.38	211.42	2477.44	99.94 S	64.75 W	-63.23	2.08
2581.00	8.95	208.27	2572.21	113.19 S	72.37 W	-70.64	0.69
2675.00	8.85	208.43	2665.08	125.99 S	79.27 W	-77.35	0.11
2770.00	9.10	208.27	2758.92	139.03 S	86.31 W	-84.19	0.26
2865.00	9.32	210.16	2852.69	152.30 S	93.73 W	-91.41	0.39
2959.00	7.77	197.86	2945.65	164.93 S	99.51 W	-96.99	2.54
3053.00	6.76	181.37	3038.91	176.51 S	101.59 W	-98.90	2.45
3148.00	5.45	180.01	3133.37	186.61 S	101.72 W	-98.88	1.39
3243.00	3.69	169.89	3228.06	194.13 S	101.19 W	-98.23	2.03
3337.00	2.71	132.24	3321.92	198.60 S	99.01 W	-95.98	2.41
3432.00	2.12	75.86	3416.85	199.69 S	95.64 W	-92.60	2.46
3526.00	1.02	359.32	3510.82	198.42 S	93.97 W	-90.94	2.26
3621.00	1.02	353.52	3605.81	196.74 S	94.07 W	-91.08	0.11
3716.00	0.97	348.53	3700.79	195.11 S	94.33 W	-91.36	0.11
3810.00	1.21	340.19	3794.78	193.40 S	94.82 W	-91.88	0.31
3905.00	1.23	333.69	3889.76	191.54 S	95.61 W	-92.70	0.15
3999.00	1.40	336.21	3983.73	189.58 S	96.53 W	-93.64	0.19
4093.00	1.18	338.35	4077.71	187.63 S	97.35 W	-94.49	0.24
4187.00	0.94	337.14	4171.69	186.02 S	98.00 W	-95.17	0.26
4282.00	1.03	343.74	4266.68	184.49 S	98.54 W	-95.73	0.15
4376.00	1.09	349.40	4360.66	182.80 S	98.95 W	-96.16	0.13
4470.00	1.10	0.70	4454.64	181.01 S	99.10 W	-96.34	0.23
4564.00	0.96	268.25	4548.63	180.14 S	99.87 W	-97.13	1.59
4658.00	1.17	271.89	4642.62	180.13 S	101.62 W	-98.87	0.23
4753.00	1.05	275.84	4737.60	180.01 S	103.46 W	-100.71	0.15
5037.00	0.82	285.16	5021.56	179.21 S	108.01 W	-105.27	0.10
5131.00	1.52	188.23	5115.55	180.27 S	108.83 W	-106.08	1.93
5319.00	1.56	167.90	5303.48	185.24 S	108.65 W	-105.83	0.29
5509.00	1.07	171.71	5493.43	189.52 S	107.86 W	-104.97	0.26
5698.00	0.84	166.69	5682.40	192.62 S	107.28 W	-104.35	0.13
5793.00	0.42	145.14	5777.40	193.58 S	106.92 W	-103.97	0.50
5929.00	0.24	280.98	5913.40	193.94 S	106.92 W	-103.96	0.45
6077.00	7.62	106.26	6060.97	196.63 S	97.79 W	-94.79	5.31
6172.00	13.54	111.70	6154.32	202.51 S	81.39 W	-78.31	6.31
6267.00	18.72	116.76	6245.55	213.49 S	57.43 W	-54.18	5.64
6361.00	24.12	119.27	6333.03	229.69 S	27.19 W	-23.69	5.83
6456.00	30.94	119.58	6417.22	251.26 S	11.03 E	14.84	7.18
6504.00	35.07	115.58	6457.47	263.31 S	34.21 E	38.21	9.72
6550.00	38.47	110.66	6494.32	274.07 S	59.53 E	63.69	9.77
6598.00	42.15	103.32	6530.94	283.06 S	89.20 E	93.49	12.51
6645.00	46.27	102.02	6564.62	290.23 S	121.17 E	125.57	8.98
6739.00	58.95	93.10	6621.66	299.53 S	194.99 E	199.52	15.43
6834.00	73.04	87.31	6660.24	299.60 S	281.51 E	286.03	15.83
6890.00	79.68	87.83	6673.44	297.30 S	335.85 E	340.33	11.89
6963.00	88.49	86.06	6680.95	293.42 S	408.28 E	412.69	12.31
7017.00	88.49	86.06	6682.38	289.71 S	462.14 E	466.48	0.00

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 90.87 DEGREES (GRID)
A TOTAL CORRECTION OF 7.44 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7017.00 FEET
IS 545.44 FEET ALONG 122.08 DEGREES (GRID)**

Surface surveys at 366 ft, 613 ft and 859 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 6963 ft MD to TD at 7017 ft MD.

