



1 : 600 / 1 : 240

MWD Run Number	100				
Date run completed	31-Mar-15				
Rig Bit Number	2				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.750				
Log Start Depth (TVD, ft)	947.87				
Log End Depth (TVD, ft)	6,633.32				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	30-Mar-15 11:05				
Drill/Wipe End Date and Time	31-Mar-15 17:00				
Min Inc (deg) @ Depth (TVD, ft)	0.55 @ 5,747.68				
Max Inc (deg) @ Depth (TVD, ft)	78.49 @ 6,625.58				
Bit TFA(in2) / Bit Type	0.91 / PDC				
Flow Rate (gpm)	583.28				
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A				
Fluid Type	Fresh Water Gel				
Density (ppg) / Viscosity (spqt)	10.20 / 26.00				
Filtrate CL (ppm)	1,200.00				
pH / Fluid Loss (mptm)	10.00 / 59				
PV (cP) / YP (lbf2)	1 / 4.00				
% Solids / % Sand	5.1 / 0.30				
% 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	175.40 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Ryan Skaarvold				
Customer Representative	Dave Nielsen				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	246473				
Insert Serial Number	11400937				
Date and Time Initialized	29-Mar-15 21:54				
Date and Time Read	31-Mar-15 23:33				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	49.14				
Software Version	6.21				
Sub Serial Number	246473				
Sonde Serial Number	11638605				
Sensor ID Number	N/A				
Toolface Offset (deg)	51.00				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	39.02				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	246473				
Insert/Sonde Serial Number	11293417				

REMARKS

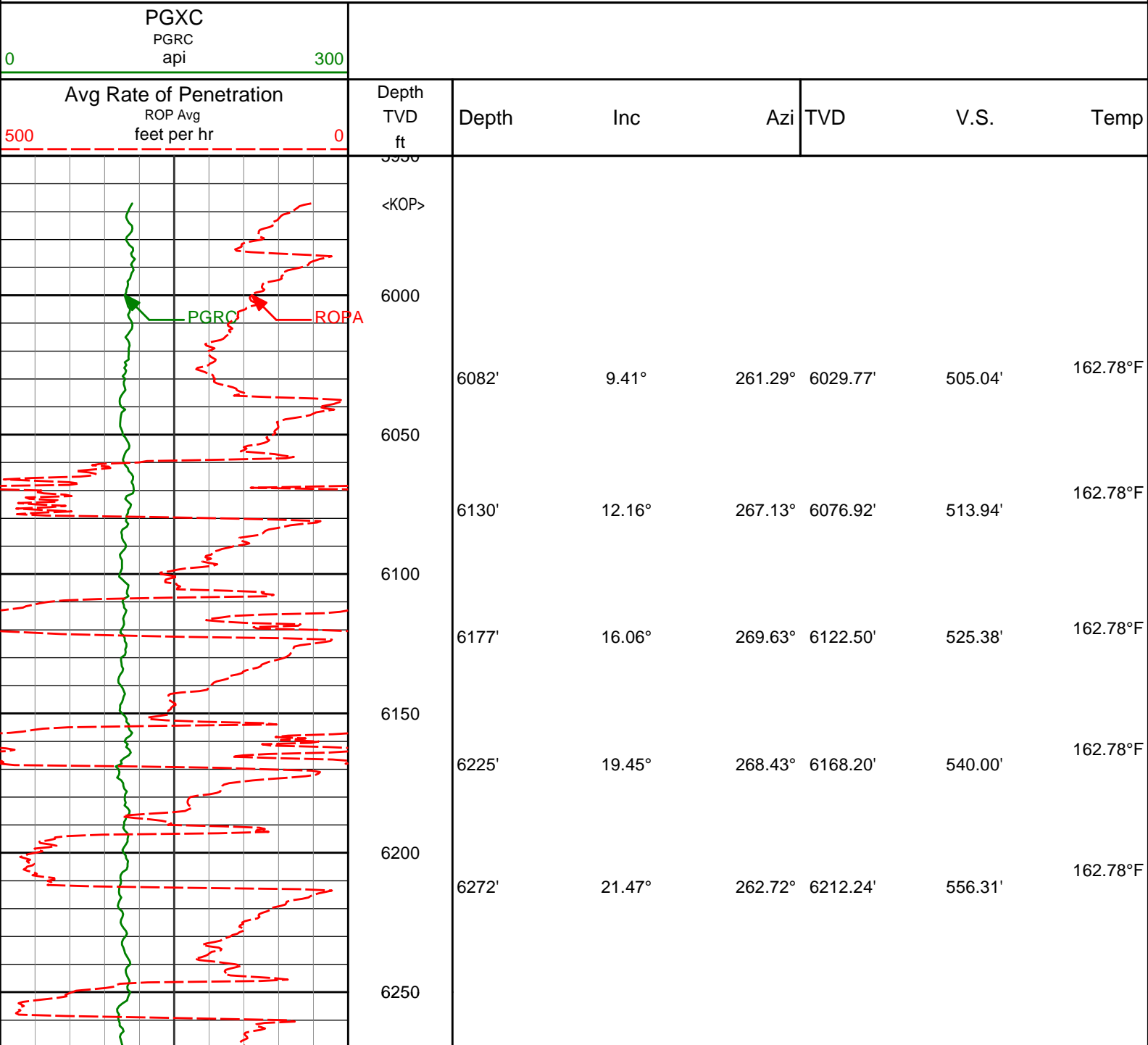
1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.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

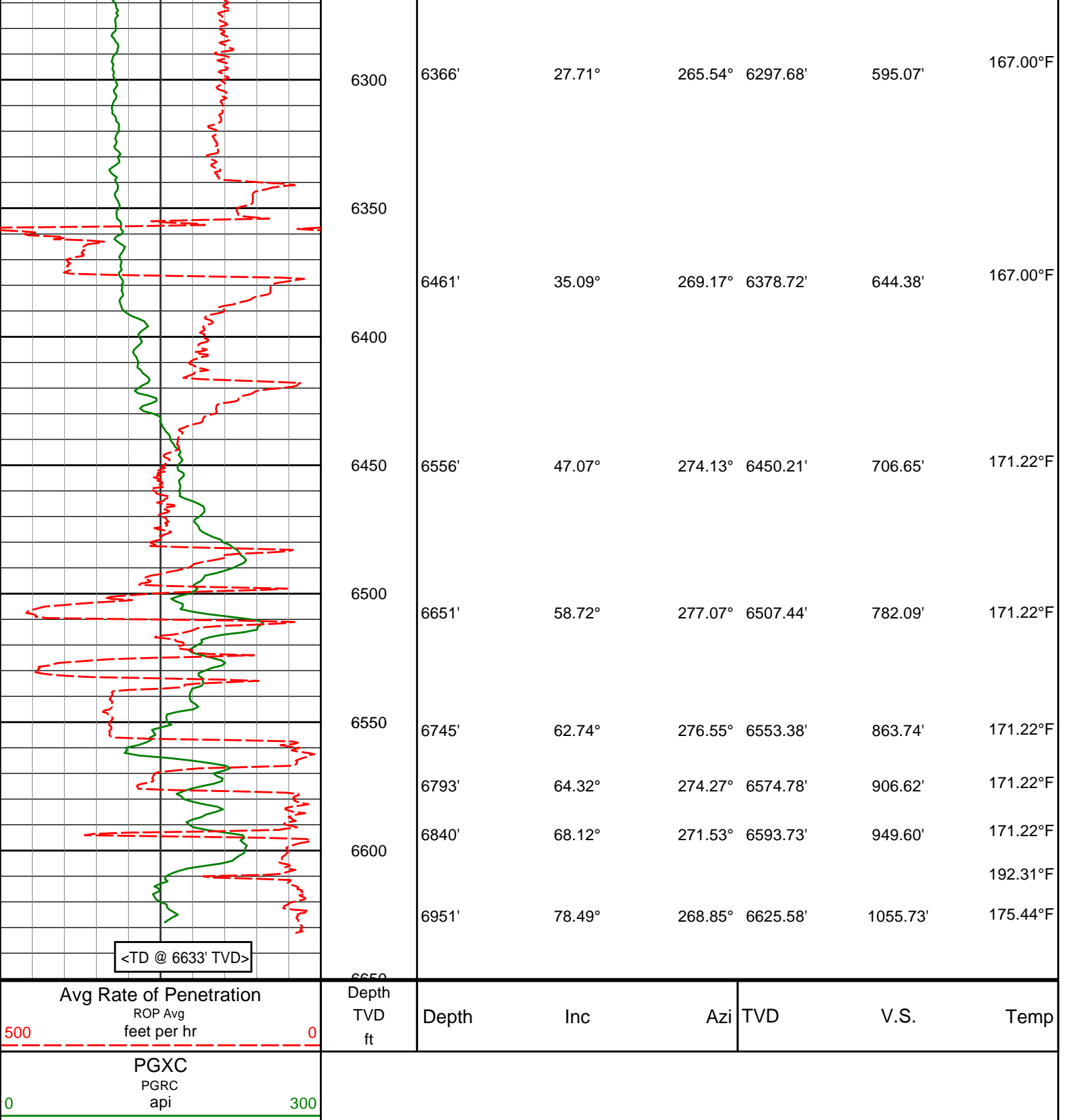
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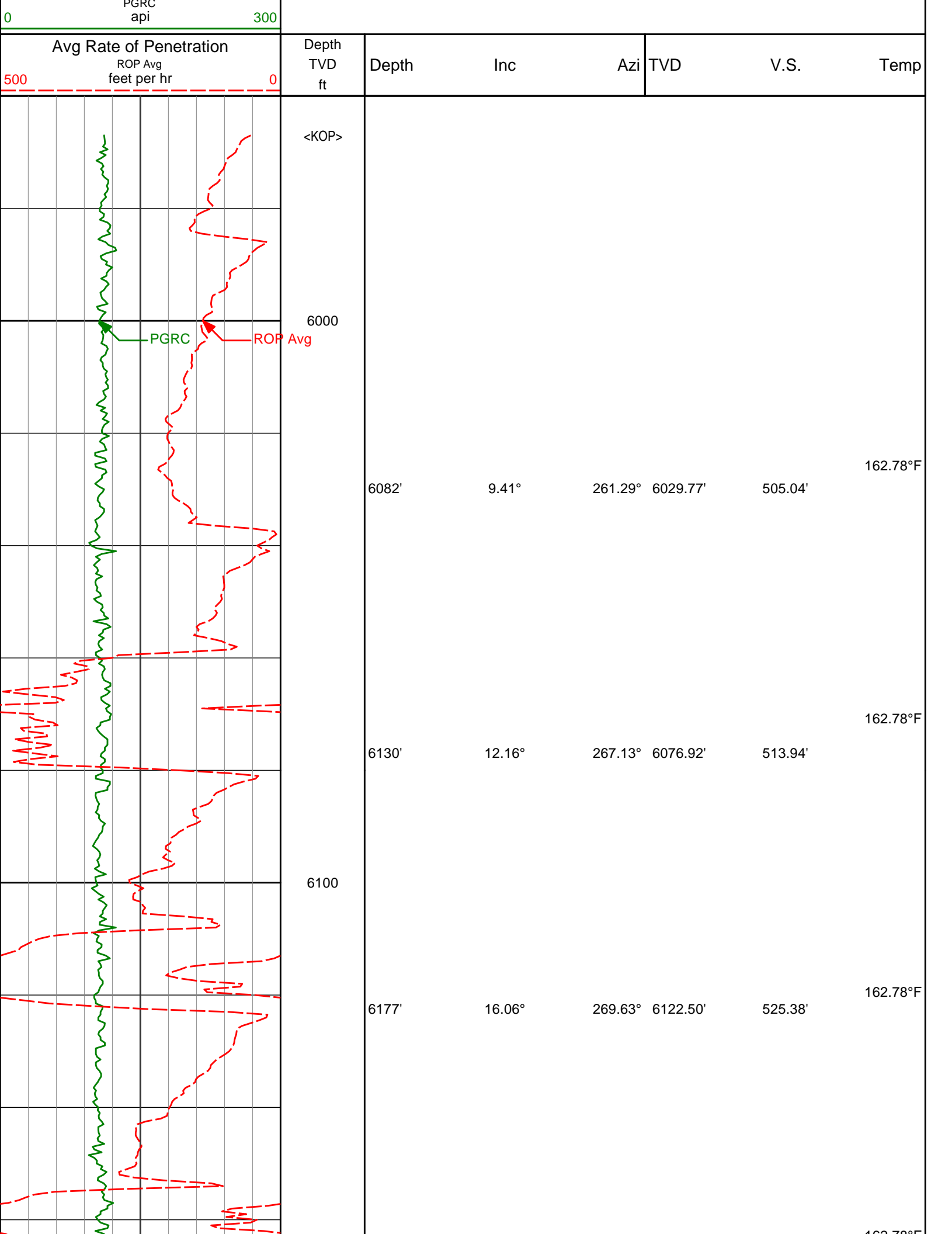
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TVD Detail 1:600 Scale



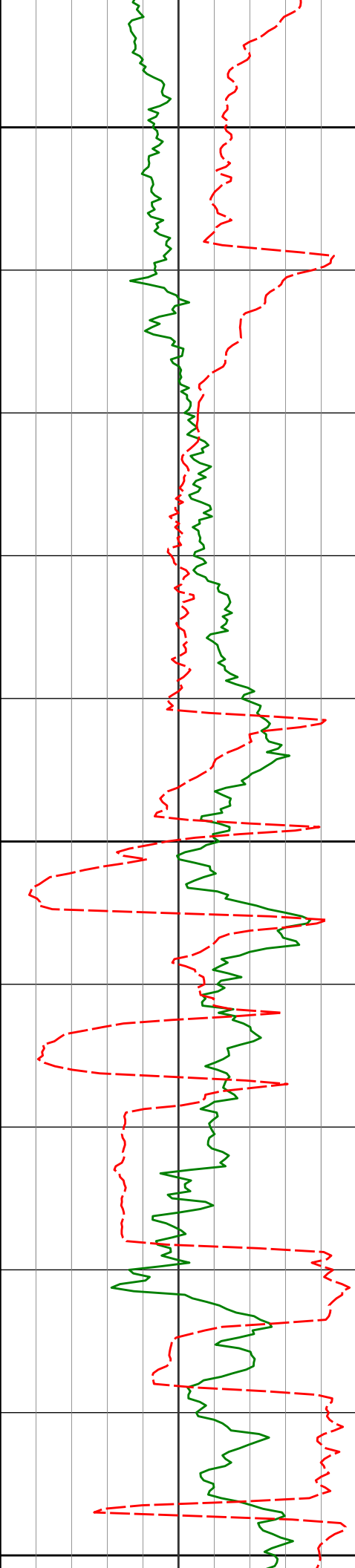


TVD Detail 1:240 Scale





6225'	19.45°	268.43°	6168.20'	540.00'	162.78°F
6200					
6272'	21.47°	262.72°	6212.24'	556.31'	162.78°F
6300					167.00°F
6366'	27.71°	265.54°	6297.68'	595.07'	
6461'	35.09°	269.17°	6378.72'	644.38'	167.00°F



6400

6556'

47.07°

274.13°

6450.21'

706.65'

171.22°F

6500

6651'

58.72°

277.07°

6507.44'

782.09'

171.22°F

6745'

62.74°

276.55°

6553.38'

863.74'

171.22°F

6793'

64.32°

274.27°

6574.78'

906.62'

171.22°F

6840'

68.12°

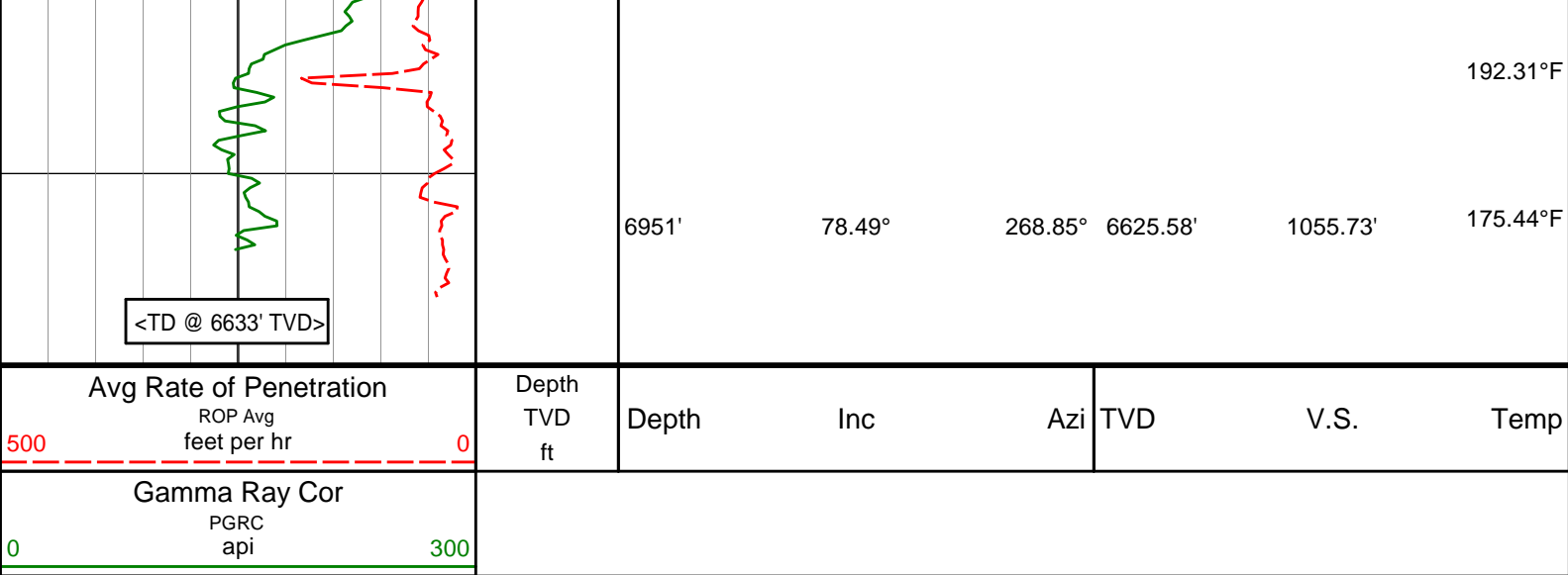
271.53°

6593.73'

949.60'

171.22°F

6600



HALLIBURTON

DIRECTIONAL SURVEY REPORT

**Noble Energy
Colt A13-635
Wattenberg
Weld Colorado
USA
CA-XX-0902119900**

<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
268.00	0.80	172.43	267.99	1.85 S	0.25 E	-0.30	0.30
640.00	1.20	237.43	639.94	6.53 S	2.69 W	2.50	0.30
915.00	1.40	263.93	914.88	8.43 S	8.46 W	8.21	0.23
1015.00	1.66	31.78	1014.86	7.33 S	8.91 W	8.69	2.75
1110.00	5.27	0.82	1109.68	1.79 S	8.13 W	8.07	4.15
1202.00	6.99	341.63	1201.16	7.74 N	9.83 W	10.05	2.88
1294.00	8.09	318.16	1292.38	17.88 N	15.91 W	16.43	3.52
1480.00	7.82	317.17	1476.59	36.91 N	33.25 W	34.32	0.16
1664.00	6.58	300.23	1659.16	51.40 N	50.87 W	52.36	1.33
1756.00	7.81	291.12	1750.43	56.31 N	61.25 W	62.89	1.82
1848.00	9.54	303.20	1841.39	62.74 N	73.47 W	75.28	2.72
2033.00	9.24	309.66	2023.91	80.61 N	97.73 W	100.06	0.59
2126.00	8.60	322.28	2115.79	90.88 N	107.73 W	110.37	2.21
2219.00	8.54	318.32	2207.76	101.54 N	116.58 W	119.52	0.64
2311.00	8.33	310.95	2298.76	111.01 N	126.15 W	129.37	1.20
2402.00	7.92	324.70	2388.86	120.44 N	134.76 W	138.25	2.18
2495.00	7.54	317.87	2481.02	130.20 N	142.55 W	146.33	1.07
2587.00	8.65	322.84	2572.10	140.19 N	150.78 W	154.85	1.43
2679.00	8.22	321.09	2663.10	150.82 N	159.09 W	163.47	0.54
2772.00	7.89	318.36	2755.19	160.76 N	167.51 W	172.18	0.54
2863.00	9.87	319.66	2845.09	171.38 N	176.71 W	181.69	2.19
3051.00	9.66	314.62	3030.37	194.74 N	198.37 W	204.02	0.47
3145.00	9.56	312.52	3123.05	205.55 N	209.73 W	215.70	0.39
3240.00	10.06	321.71	3216.67	217.40 N	220.69 W	227.00	1.73
3334.00	10.06	317.29	3309.23	229.88 N	231.35 W	238.02	0.82
3429.00	9.46	312.51	3402.85	241.25 N	242.73 W	249.74	1.06
3524.00	8.58	310.33	3496.68	251.11 N	253.89 W	261.18	0.99
3619.00	8.82	310.64	3590.58	260.44 N	264.81 W	272.38	0.26
3714.00	10.48	317.97	3684.24	271.60 N	276.13 W	284.02	2.17
3809.00	10.62	319.02	3777.63	284.63 N	287.65 W	295.92	0.25
3905.00	11.32	317.56	3871.88	298.26 N	299.81 W	308.48	0.78
3999.00	11.19	317.37	3964.07	311.78 N	312.22 W	321.27	0.14
4094.00	10.70	316.43	4057.34	324.95 N	324.54 W	333.98	0.55

4188.00	10.24	316.55	4149.78	337.34 N	336.30 W	346.10	0.49
4283.00	9.63	316.57	4243.35	349.24 N	347.57 W	357.72	0.64
4378.00	9.02	315.02	4337.10	360.28 N	358.29 W	368.76	0.69
4473.00	8.87	314.55	4430.94	370.68 N	368.78 W	379.55	0.18
4568.00	8.50	314.82	4524.85	380.77 N	378.98 W	390.04	0.39
4663.00	7.97	315.00	4618.87	390.38 N	388.61 W	399.96	0.56
4758.00	7.54	314.44	4713.00	399.40 N	397.72 W	409.33	0.46
4853.00	6.90	312.84	4807.25	407.64 N	406.36 W	418.20	0.71
4947.00	6.48	314.70	4900.61	415.21 N	414.27 W	426.33	0.50
5042.00	8.75	316.90	4994.76	424.26 N	423.02 W	435.34	2.41
5137.00	8.24	314.77	5088.72	434.33 N	432.79 W	445.41	0.63
5232.00	7.52	317.62	5182.82	443.72 N	441.81 W	454.70	0.86
5326.00	6.48	314.42	5276.12	451.97 N	449.74 W	462.88	1.18
5420.00	5.79	319.97	5369.59	459.32 N	456.58 W	469.93	0.97
5515.00	5.28	318.13	5464.14	466.24 N	462.58 W	476.13	0.57
5610.00	3.91	303.52	5558.84	471.29 N	468.20 W	481.90	1.89
5704.00	2.11	292.76	5652.70	473.73 N	472.47 W	486.23	2.00
5799.00	0.55	326.42	5747.68	474.78 N	474.33 W	488.13	1.77
5893.00	0.74	310.46	5841.67	475.55 N	475.04 W	488.86	0.28
6082.00	9.41	261.29	6029.77	474.00 N	491.28 W	505.04	4.73
6130.00	12.16	267.13	6076.92	473.15 N	500.21 W	513.94	6.16
6177.00	16.06	269.63	6122.50	472.86 N	511.66 W	525.38	8.40
6225.00	19.45	268.43	6168.20	472.60 N	526.29 W	540.00	7.10
6272.00	21.47	262.72	6212.24	471.30 N	542.65 W	556.31	6.04
6366.00	27.71	265.54	6297.68	467.41 N	581.54 W	595.07	6.75
6461.00	35.09	269.17	6378.72	465.30 N	630.94 W	644.38	8.02
6556.00	47.07	274.13	6450.21	467.41 N	693.17 W	706.65	13.06
6651.00	58.72	277.07	6507.44	474.94 N	768.42 W	782.09	12.51
6745.00	62.74	276.55	6553.38	484.66 N	849.82 W	863.74	4.30
6793.00	64.32	274.27	6574.78	488.70 N	892.59 W	906.62	5.38
6840.00	68.12	271.53	6593.73	490.86 N	935.53 W	949.60	9.69
6951.00	78.49	268.85	6625.58	491.15 N	1041.70 W	1055.73	9.62
7002.00	84.05	268.25	6633.32	489.87 N	1092.07 W	1106.04	10.96

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 271.69 DEGREES (GRID)
A TOTAL CORRECTION OF 7.43 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7002.00 FEET
IS 1196.91 FEET ALONG 294.16 DEGREES (GRID)**

Surface surveys at 268 ft, 640 ft and 915 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 6951 ft MD to TD at 7002 ft MD.