

Natural Gamma Ray Rate Of Penetration



1 : 600

| | | | | | |
|------------------------|--|--------------------------------|-------------|-------------|-----------------------|
| County | : Reno Co | | | | |
| Field | : Wildcat | | | | |
| Location | : Lat: 38° 0' 0.63" North Long: 98° 16' 22.40" West | | | | |
| Well | : Young Trust 2309 35-1H | | | | |
| Company | : Shell Exploration & Production | | | | |
| Rig | : Nabors 102 | | | | |
| LOCATION | Latitude : 38° 0' 0.63" North | Other Services | | | |
| | Longitude : 98° 16' 22.40" West | | | | |
| | UTM Easting = 2,065,442.620 ft | Directional | | | |
| | UTM Northing = 485,630.240 ft | | | | |
| Company | : Shell Exploration & Production | | | | |
| Rig | : Nabors 102 | | | | |
| Well | : Young Trust 2309 35-1H | | | | |
| Field | : Wildcat | | | | |
| County | : Reno Co | | | | |
| API Number | : 15155216130100 | | | | |
| Permanent Datum | : Ground Level | Elevation : 1698.00 ft | | | |
| Log Measured From | : Drill Floor | 31.70 ft Above Permanent Datum | | | |
| Drilling Measured From | : Drill Floor | TVD LOG | | | |
| Depth Logged | : 90.00 ft To 3,806.92 ft | Unit No. : PP #46 | | | |
| Date Logged | : 18-Feb-13 To 11-Mar-13 | Job No. :OK-XX-0900034106 | | | |
| Total Depth MD | : 8,130.00 ft TVD : 3,806.92 ft | Plot Type : Final | | | |
| Spud Date | : 19-Feb-13 | Plot Date : 12-Mar-13 | | | |
| Run No. | Size | Borehole Record (TVD) | Run No. | Size | Borehole Record (TVD) |
| | 100 | 12.250 in | From | 90.00 ft | To |
| | 200 | 8.750 in | From | 349.98 ft | To |
| | 300 | 6.125 in | From | 3,822.79 ft | To |
| 400 | 6.125 in | From | 3,814.34 ft | To | |
| | | | From | 3,806.92 ft | To |
| | | | Size | Weight | Casing Record (TVD) |
| | | | 6.125 in | 36.00 lbpf | From |
| | | | 7.000 in | 26.00 lbpf | From |
| | | | | | To |
| | | | | | 341.98 ft |
| | | | | | 3,822.57 ft |

WELL INFORMATION

| | | | | |
|----------------------------------|-----------------|------------------|------------------|------------------|
| MWD Run Number | 100 | 200 | 300 | 400 |
| Date run completed | 20-Feb-13 | 07-Mar-13 | 11-Mar-13 | 11-Mar-13 |
| Rig Bit Number | 100 | 200 | 300 | 400 |
| Bit Size (in) | 12.250 | 8.750 | 6.125 | 6.125 |
| Tool Nominal OD (in) | 6.750 | 6.750 | 4.750 | 4.750 |
| Log Start Depth (TVD, ft) | 90.00 | 349.98 | 3,822.79 | 3,814.34 |
| Log End Depth (TVD, ft) | 349.98 | 3,822.79 | 3,814.34 | 3,806.92 |
| Drill or Wipe | Drill | Drill | Drill | Drill |
| Drill/Wipe Start Date and Time | 20-Feb-13 02:30 | 05-Mar-13 13:00 | 09-Mar-13 03:10 | 11-Mar-13 08:05 |
| Drill/Wipe End Date and Time | 20-Feb-13 08:55 | 07-Mar-13 15:35 | 10-Mar-13 22:10 | 11-Mar-13 13:45 |
| Min Inc (deg) @ Depth (TVD, ft) | .14 @ 141.00 | .95 @ 3,200.21 | 88.25 @ 3,827.16 | 89.63 @ 3,814.28 |
| Max Inc (deg) @ Depth (TVD, ft) | .71 @ 285.99 | 87.91 @ 3,821.00 | 92.22 @ 3,820.91 | 92.24 @ 3,810.84 |
| Bit TFA(in2) / Bit Type | .65 / PDC | .38 / PDC | .29 / PDC | .29 / PDC |
| Flow Rate (gpm) | 500.00 | 595.00 | 300.00 | 300.00 |
| Max AV (fpm) / CV (fpm) @ MWD | 315.0 / 472.0 | 351.0 / 485.0 | 437.0 / 655.0 | 537.0 / 805.0 |
| Fluid Type | Fresh Water Gel | Fresh Water Gel | Fresh Water Gel | Fresh Water Gel |
| Density (ppg) / Viscosity (spqt) | 8.40 / 26.00 | 8.85 / 31.00 | 8.45 / 29.00 | 8.50 / 31.00 |
| Filtrate CL (ppm) | 3,000.00 | 52,000.00 | 800.00 | 550.00 |
| pH / Fluid Loss (mptm) | 8.60 / 7 | 9.30 / 5 | 9.80 / 8 | 8.00 / 7 |
| PV (cP) / YP (lhf2) | 1 / 1.00 | 3 / 6.00 | 2 / 3.00 | 4 / 6.00 |
| % Solids / % Sand | 0.01 / 0.01 | 1.5 / .25 | 1.3 / .50 | 1.5 / 0.75 |
| % Oil / Oil:Water Ratio | N/A / N/A | 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 | N/A @ N/A |
| Rmf @ Measured Temp (degF) | N/A @ N/A | 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 | N/A @ N/A | |
| Max Tool Temp (degF) / Source | 57.30 / PCM | 144.54 / PCM | 145.00 / PCM | 116.00 / PCM | |
| Rm @ Max Tool Temp (degF) | N/A @ 57.30 | N/A @ 144.54 | N/A @ 145.00 | N/A @ 116.00 | |
| Lead MWD Engineer | Aaron Ashu | Aaron Ashu | Aaron Ashu | Aaron Ashu | |
| Customer Representative | Clayton Carmack | Clayton Carmack | Clayton Carmack | Clayton Carmack | |

SENSOR INFORMATION

Downhole Processor Information

| | | | | | |
|---------------------------|-----------------|-----------------|-----------------|-----------------|--|
| Tool Type | PCM | PCM | PCM | PCM | |
| Software Version | 5.28 | 5.28 | 5.28 | 5.28 | |
| Sub Serial Number | 11341316 | 11341316 | 11232127 | 11232127 | |
| Insert Serial Number | 11619991 | 11619991 | 11680900 | 11680900 | |
| Date and Time Initialized | 18-Feb-13 19:07 | 04-Mar-13 14:44 | 07-Mar-13 23:02 | 07-Mar-13 23:02 | |
| Date and Time Read | 20-Feb-13 10:43 | 07-Mar-13 18:50 | 11-Mar-13 20:01 | 11-Mar-13 20:08 | |
| ECMB SW Version | N/A | N/A | N/A | N/A | |

Directional Sensor Information

| | | | | | |
|------------------------|----------|----------|----------|----------|--|
| Tool Type | PCDC | PCDC | PCDC | PCDC | |
| Distance From Bit (ft) | 60.63 | 51.99 | 49.97 | 50.92 | |
| Software Version | 6.21 | 6.21 | 6.21 | 6.21 | |
| Sub Serial Number | 11341316 | 11341316 | 11232127 | 11232127 | |
| Sonde Serial Number | 11478088 | 11833032 | 11833032 | 11833032 | |
| Sensor ID Number | N/A | N/A | N/A | N/A | |
| Toolface Offset (deg) | 329.77 | 162.42 | 130.70 | 274.85 | |

Gamma Ray Sensor Information

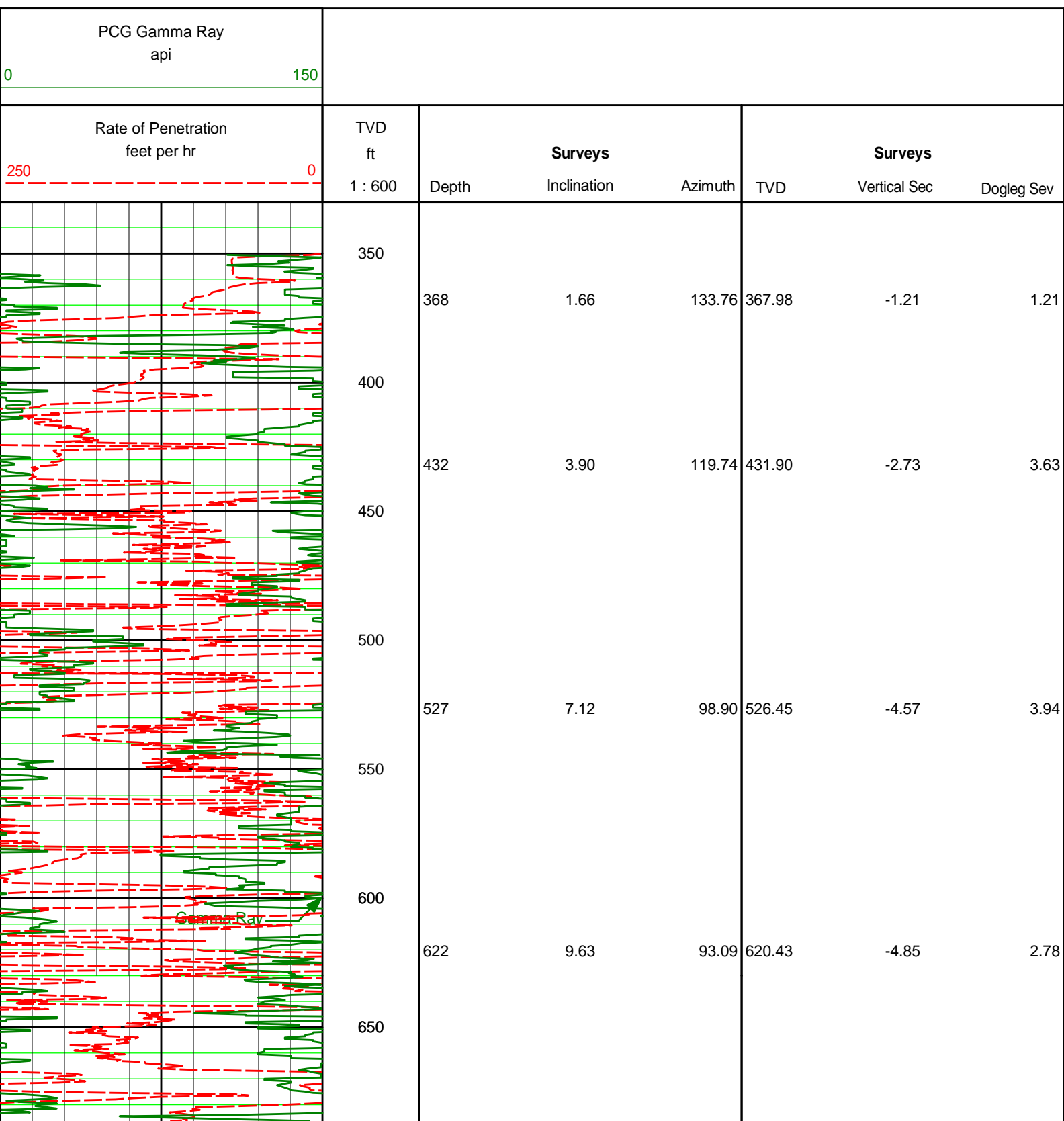
| | | | | | |
|------------------------------|-----|----------|----------|----------|--|
| Tool Type | N/A | PCG | PCG | PCG | |
| Distance From Bit (ft) | N/A | 46.93 | 44.89 | 45.84 | |
| Recorded Sample Period (sec) | N/A | 10 | 10 | 10 | |
| Software Version | N/A | 8.15 | 8.15 | 8.15 | |
| Sub Serial Number | N/A | 11341316 | 11232127 | 11232127 | |
| Insert/Sonde Serial Number | N/A | 11681039 | 11681039 | 11681039 | |

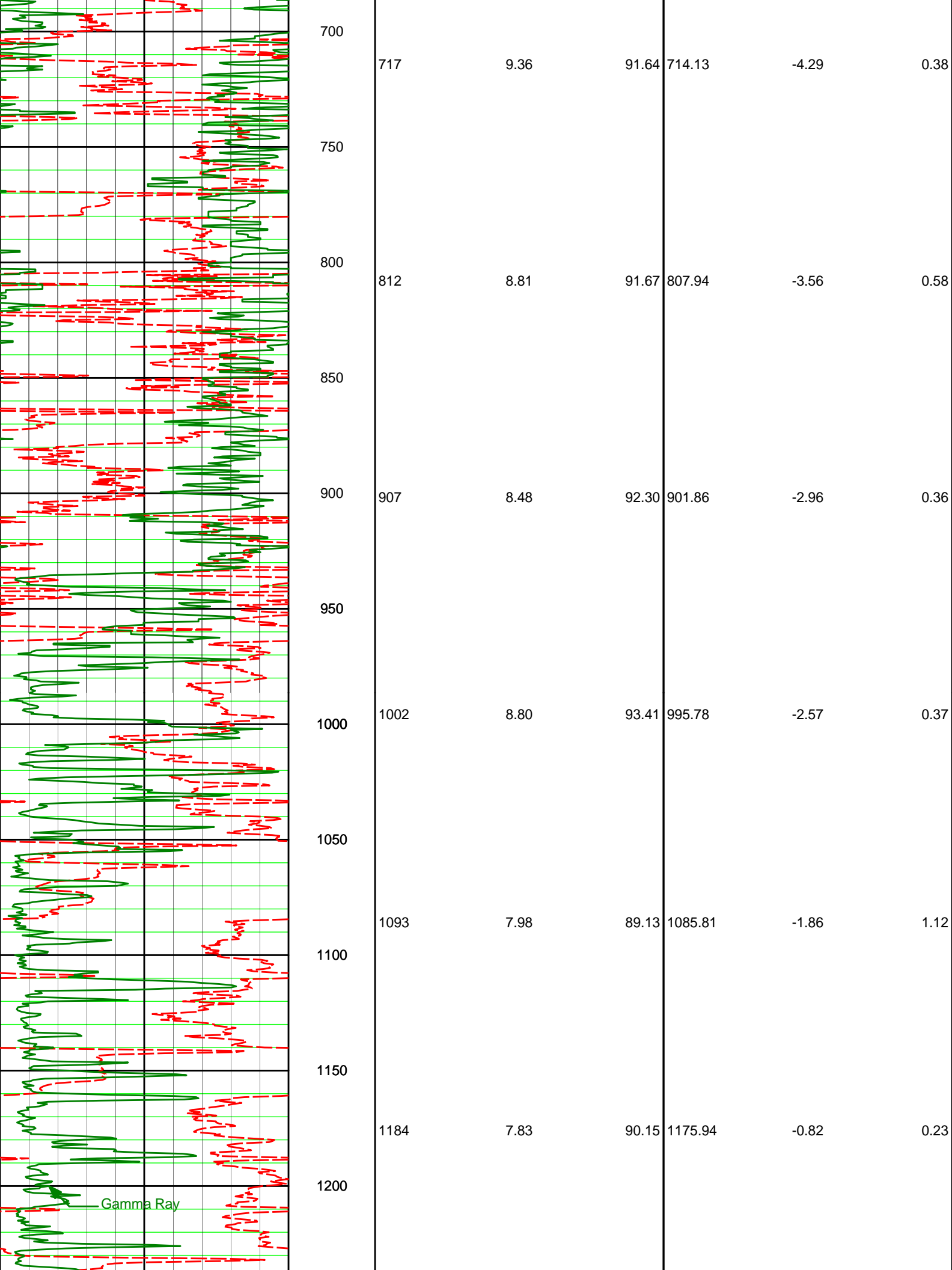
REMARKS

1. All depths are calibrated to the driller's pipe tally and are measured from the rotary table.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. Run 100 was directional only, no gamma available for this run.
5. The following smoothing parameters have been applied to the data:
 - ROP: 1.0 ft interval, 3.0 ft coercion distance.
 - GAMMA: 0.5 ft interval, 0.6 ft coercion distance.

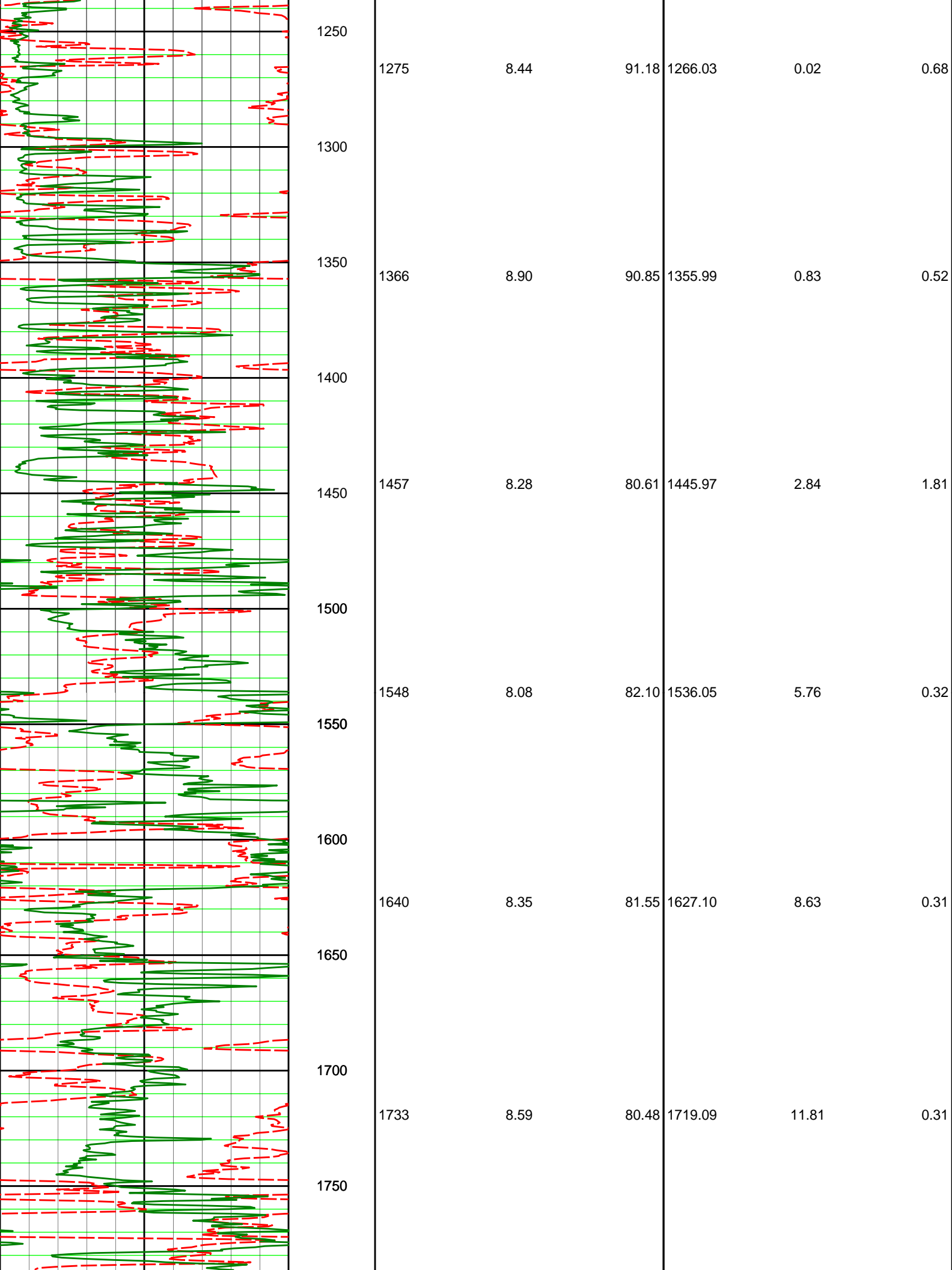
WARRANTY

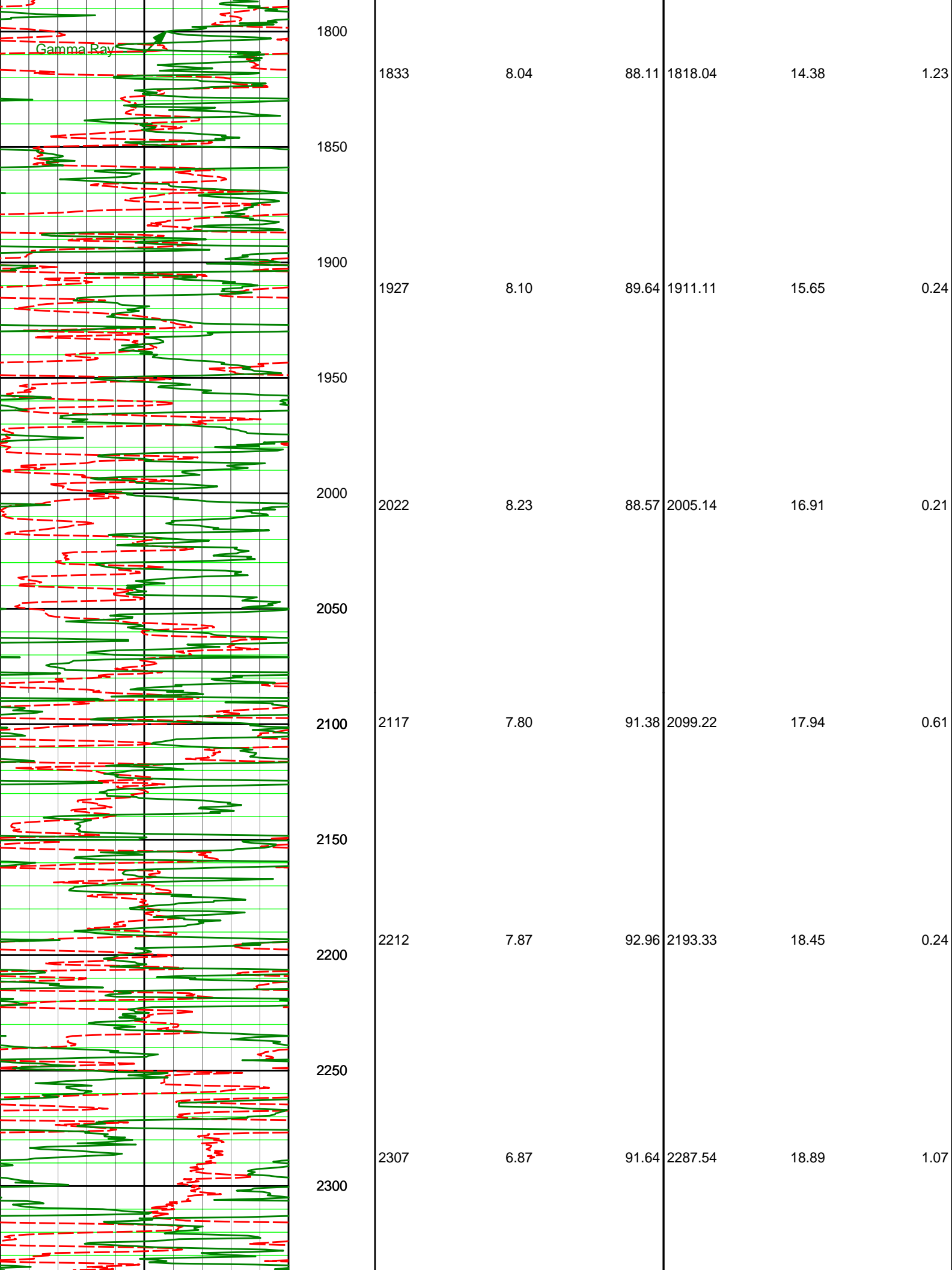
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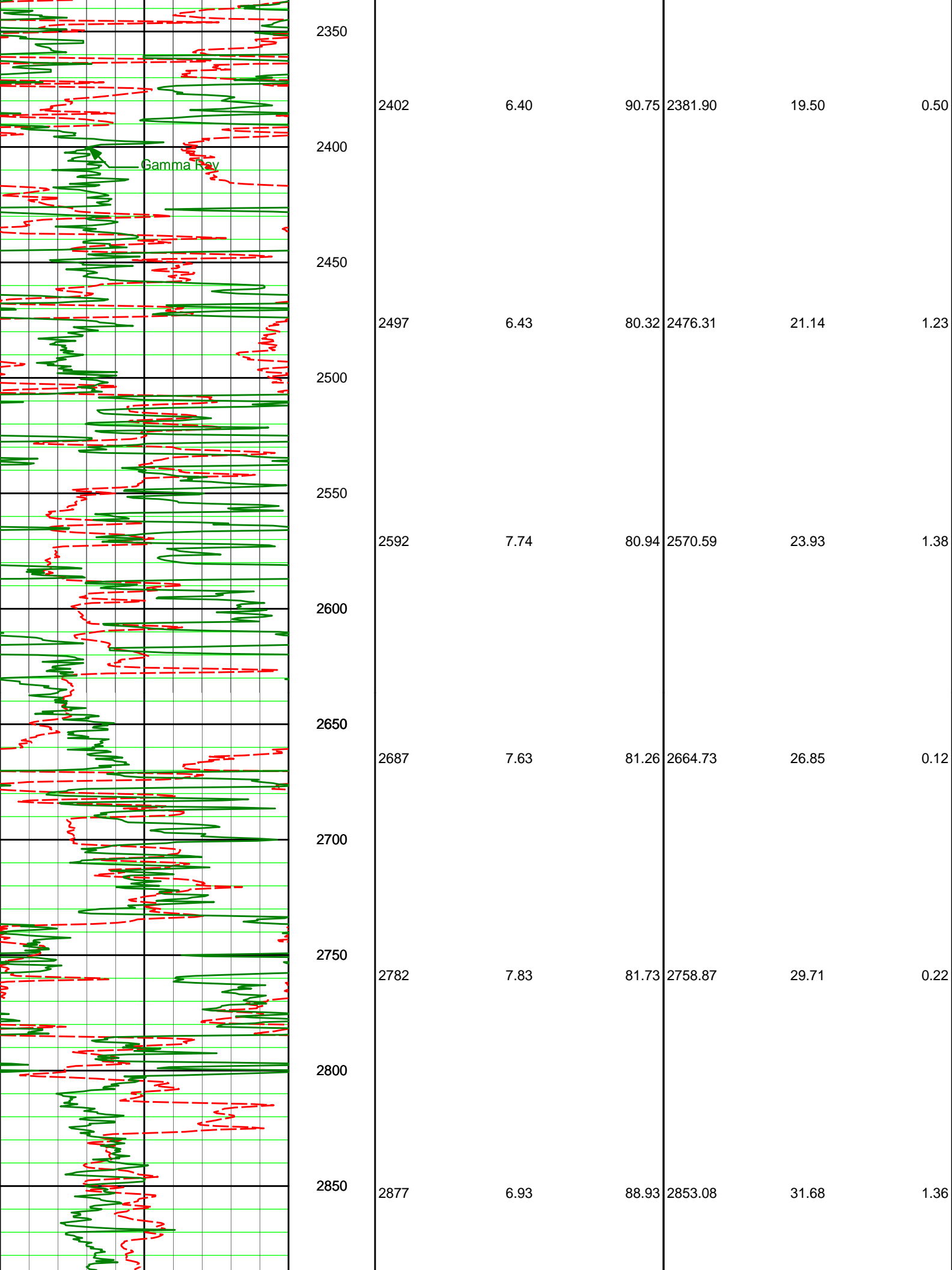


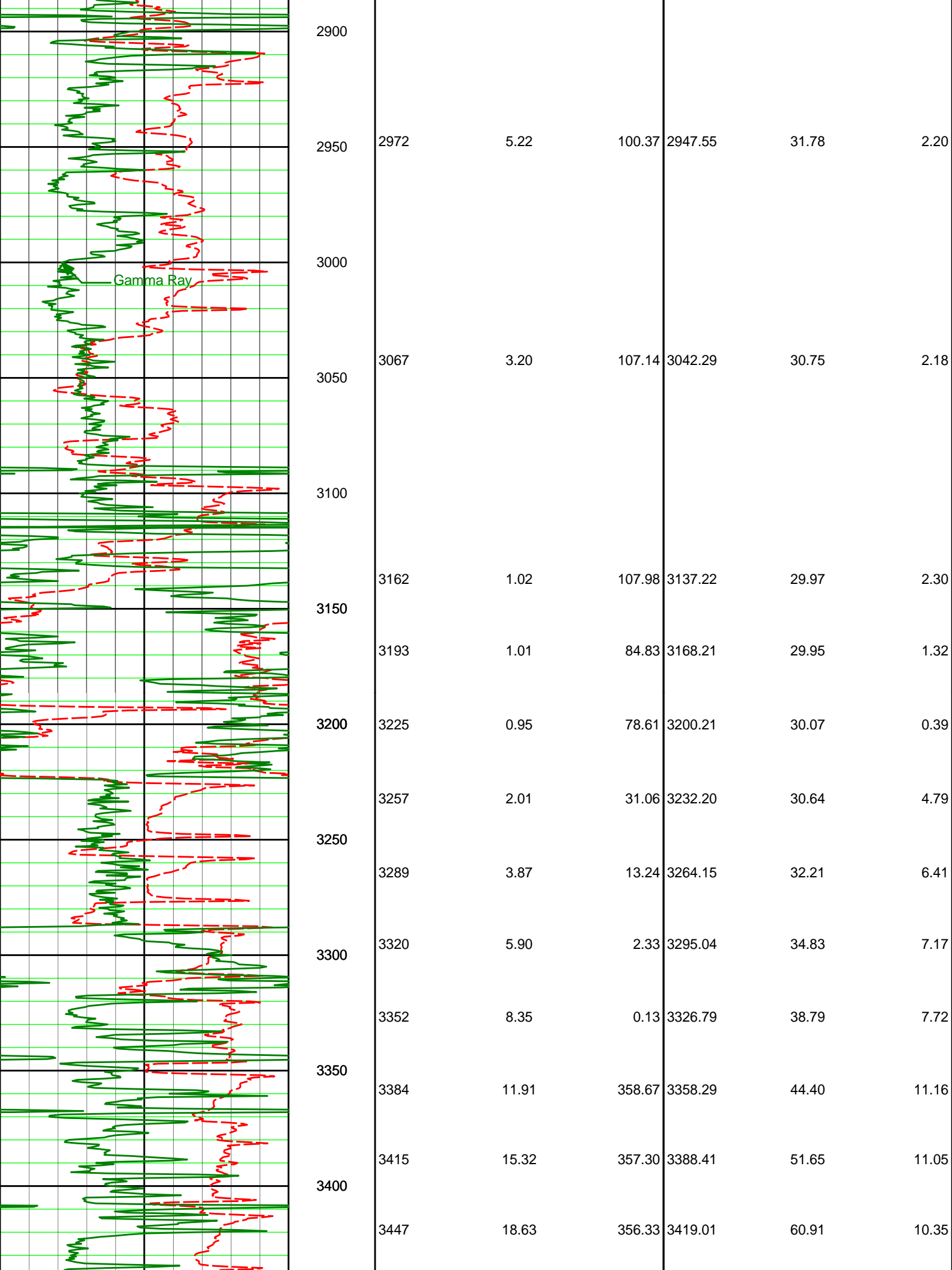


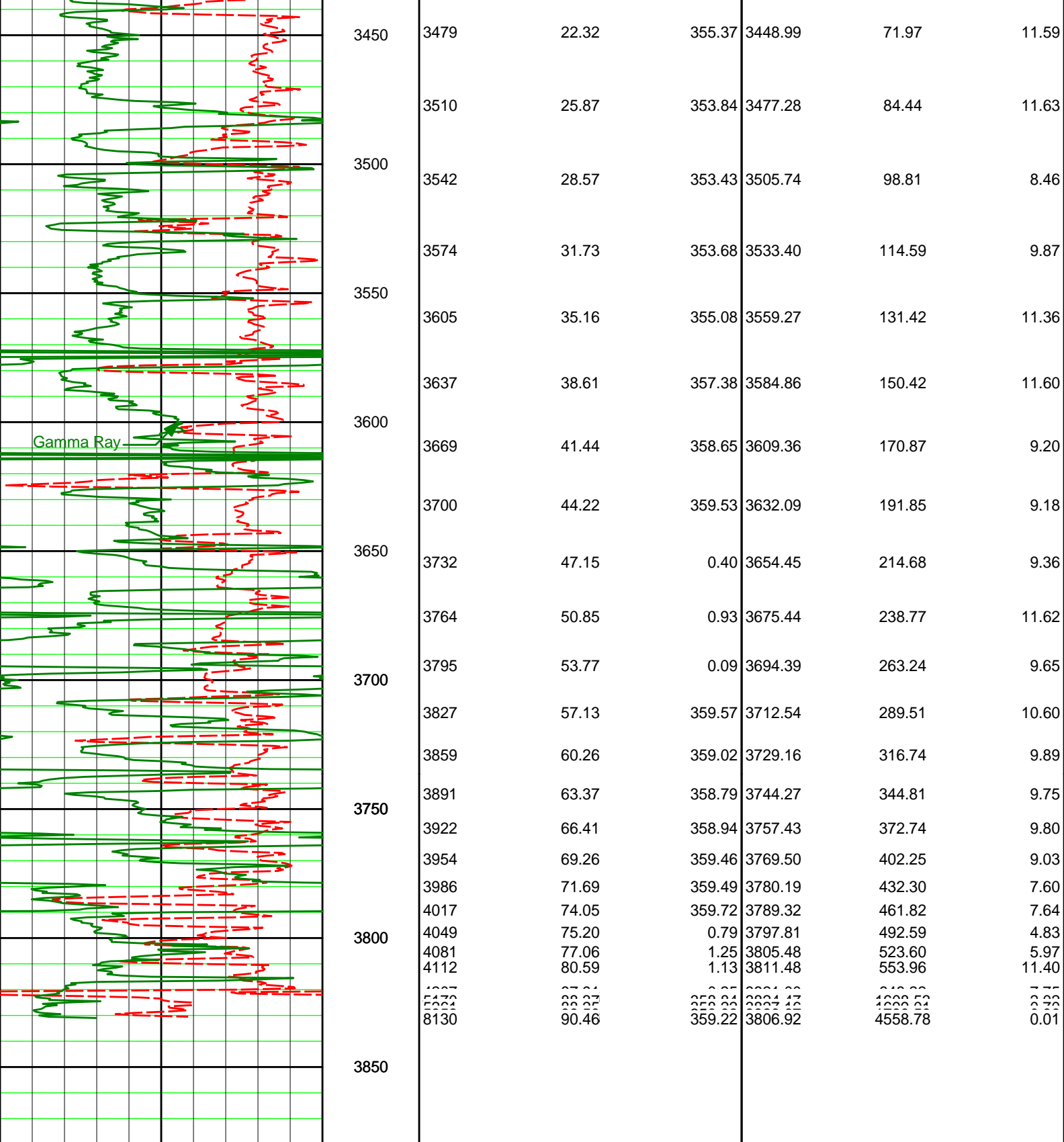
Gamma Ray











| Rate of Penetration feet per hr | TVD ft | Surveys | | | Surveys | | |
|------------------------------------|-----------|---------|-------------|---------|---------|--------------|------------|
| 250 ----- 0 | 1 : 600 | Depth | Inclination | Azimuth | TVD | Vertical Sec | Dogleg Sev |
| PCG Gamma Ray api | | | | | | | |
| 0 ----- 150 | | | | | | | |



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Shell Exploration Production

Young Trust 2309 35-1H

Wildcat

Reno Co Kansas

USA

OK-XX-0900034106

Surveys from 141' MD to 8130' MD provided by Halliburton Sperry Drilling Services.

Final Survey @ 8130' MD is a projection to the bit.

| 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 |
| 141.00 | 0.14 | 121.22 | 141.00 | 0.09 S | 0.15 E | -0.08 | 0.10 |
| 171.00 | 0.28 | 79.43 | 171.00 | 0.09 S | 0.25 E | -0.07 | 0.68 |
| 232.00 | 0.69 | 100.38 | 232.00 | 0.13 S | 0.76 E | -0.07 | 0.71 |
| 286.00 | 0.71 | 119.06 | 285.99 | 0.35 S | 1.37 E | -0.25 | 0.42 |
| 368.00 | 1.66 | 133.76 | 367.98 | 1.42 S | 2.67 E | -1.21 | 1.21 |
| 432.00 | 3.90 | 119.74 | 431.90 | 3.14 S | 5.23 E | -2.73 | 3.63 |
| 527.00 | 7.12 | 98.90 | 526.45 | 5.66 S | 13.86 E | -4.57 | 3.94 |
| 622.00 | 9.63 | 93.09 | 620.43 | 6.99 S | 27.61 E | -4.85 | 2.78 |
| 717.00 | 9.36 | 91.64 | 714.13 | 7.64 S | 43.26 E | -4.29 | 0.38 |
| 812.00 | 8.81 | 91.67 | 807.94 | 8.08 S | 58.25 E | -3.56 | 0.58 |
| 907.00 | 8.48 | 92.30 | 901.86 | 8.57 S | 72.53 E | -2.96 | 0.36 |
| 1002.00 | 8.80 | 93.41 | 995.78 | 9.29 S | 86.78 E | -2.57 | 0.37 |
| 1093.00 | 7.98 | 89.13 | 1085.81 | 9.60 S | 100.05 E | -1.86 | 1.12 |
| 1184.00 | 7.83 | 90.15 | 1175.94 | 9.52 S | 112.57 E | -0.82 | 0.23 |
| 1275.00 | 8.44 | 91.18 | 1266.03 | 9.68 S | 125.44 E | 0.02 | 0.68 |
| 1366.00 | 8.90 | 90.85 | 1355.99 | 9.92 S | 139.16 E | 0.83 | 0.52 |
| 1457.00 | 8.28 | 80.61 | 1445.97 | 8.96 S | 152.66 E | 2.84 | 1.81 |
| 1548.00 | 8.08 | 82.10 | 1536.05 | 7.01 S | 165.45 E | 5.76 | 0.32 |
| 1640.00 | 8.35 | 81.55 | 1627.10 | 5.14 S | 178.47 E | 8.63 | 0.31 |
| 1733.00 | 8.59 | 80.48 | 1719.09 | 2.99 S | 192.01 E | 11.81 | 0.31 |
| 1833.00 | 8.04 | 88.11 | 1818.04 | 1.53 S | 206.37 E | 14.38 | 1.23 |
| 1927.00 | 8.10 | 89.64 | 1911.11 | 1.27 S | 219.56 E | 15.65 | 0.24 |
| 2022.00 | 8.23 | 88.57 | 2005.14 | 1.06 S | 233.05 E | 16.91 | 0.21 |
| 2117.00 | 7.80 | 91.38 | 2099.22 | 1.04 S | 246.30 E | 17.94 | 0.61 |
| 2212.00 | 7.87 | 92.96 | 2193.33 | 1.53 S | 259.25 E | 18.45 | 0.24 |
| 2307.00 | 6.87 | 91.64 | 2287.54 | 2.03 S | 271.43 E | 18.89 | 1.07 |
| 2402.00 | 6.40 | 90.75 | 2381.90 | 2.27 S | 282.40 E | 19.50 | 0.50 |
| 2497.00 | 6.43 | 80.32 | 2476.31 | 1.44 S | 292.94 E | 21.14 | 1.23 |
| 2592.00 | 7.74 | 80.94 | 2570.59 | 0.46 N | 304.50 E | 23.93 | 1.38 |
| 2687.00 | 7.63 | 81.26 | 2664.73 | 2.43 N | 317.05 E | 26.85 | 0.12 |
| 2782.00 | 7.83 | 81.73 | 2758.87 | 4.32 N | 329.70 E | 29.71 | 0.22 |
| 2877.00 | 6.93 | 88.93 | 2853.08 | 5.35 N | 341.83 E | 31.68 | 1.36 |
| 2972.00 | 5.22 | 100.37 | 2947.55 | 4.68 N | 351.82 E | 31.78 | 2.20 |
| 3067.00 | 3.20 | 107.14 | 3042.29 | 3.12 N | 358.61 E | 30.75 | 2.18 |
| 3162.00 | 1.02 | 107.98 | 3137.22 | 2.08 N | 361.95 E | 29.97 | 2.30 |
| 3193.00 | 1.01 | 84.83 | 3168.21 | 2.02 N | 362.49 E | 29.95 | 1.32 |
| 3225.00 | 0.95 | 78.61 | 3200.21 | 2.10 N | 363.03 E | 30.07 | 0.39 |
| 3257.00 | 2.01 | 31.06 | 3232.20 | 2.63 N | 363.58 E | 30.64 | 4.79 |
| 3289.00 | 3.87 | 13.24 | 3264.15 | 4.16 N | 364.12 E | 32.21 | 6.41 |
| 3320.00 | 5.90 | 2.33 | 3295.04 | 6.77 N | 364.42 E | 34.83 | 7.17 |
| 3352.00 | 8.35 | 0.13 | 3326.79 | 10.73 N | 364.49 E | 38.79 | 7.72 |
| 3384.00 | 11.91 | 358.67 | 3358.29 | 16.36 N | 364.42 E | 44.40 | 11.16 |
| 3415.00 | 15.32 | 357.30 | 3388.41 | 23.65 N | 364.16 E | 51.65 | 11.05 |
| 3447.00 | 18.63 | 356.33 | 3419.01 | 32.98 N | 363.63 E | 60.91 | 10.35 |
| 3479.00 | 22.32 | 355.37 | 3448.99 | 44.14 N | 362.81 E | 71.97 | 11.59 |
| 3510.00 | 25.87 | 353.84 | 3477.28 | 56.74 N | 361.61 E | 84.44 | 11.63 |
| 3542.00 | 28.57 | 353.43 | 3505.74 | 71.28 N | 359.98 E | 98.81 | 8.46 |
| 3574.00 | 31.73 | 353.68 | 3533.40 | 87.25 N | 358.18 E | 114.59 | 9.87 |
| 3605.00 | 35.16 | 355.08 | 3559.27 | 104.25 N | 356.52 E | 131.42 | 11.36 |
| 3637.00 | 38.61 | 357.38 | 3584.86 | 123.41 N | 355.27 E | 150.42 | 11.60 |
| 3669.00 | 41.44 | 358.65 | 3609.36 | 143.98 N | 354.56 E | 170.87 | 9.20 |
| 3700.00 | 44.22 | 359.53 | 3632.09 | 165.04 N | 354.23 E | 191.85 | 9.18 |
| 3732.00 | 47.15 | 0.40 | 3654.45 | 187.94 N | 354.23 E | 214.68 | 9.36 |
| 3764.00 | 50.05 | 0.33 | 3675.14 | 210.83 N | 354.23 E | 238.57 | 10.88 |
| 3796.00 | 52.95 | 0.26 | 3695.83 | 233.72 N | 354.23 E | 262.46 | 12.40 |
| 3828.00 | 55.85 | 0.19 | 3716.52 | 256.61 N | 354.23 E | 286.35 | 13.92 |
| 3860.00 | 58.75 | 0.12 | 3737.21 | 279.50 N | 354.23 E | 310.24 | 15.44 |
| 3892.00 | 61.65 | 0.05 | 3757.90 | 302.39 N | 354.23 E | 334.13 | 16.96 |
| 3924.00 | 64.55 | 0.08 | 3778.59 | 325.28 N | 354.23 E | 358.02 | 18.48 |
| 3956.00 | 67.45 | 0.21 | 3799.28 | 348.17 N | 354.23 E | 381.91 | 19.99 |
| 3988.00 | 70.35 | 0.34 | 3819.97 | 371.06 N | 354.23 E | 405.80 | 21.51 |
| 4020.00 | 73.25 | 0.47 | 3840.66 | 393.95 N | 354.23 E | 429.69 | 23.03 |
| 4052.00 | 76.15 | 0.60 | 3861.35 | 416.84 N | 354.23 E | 453.58 | 24.55 |
| 4084.00 | 79.05 | 0.73 | 3882.04 | 439.73 N | 354.23 E | 477.47 | 26.07 |
| 4116.00 | 81.95 | 0.86 | 3902.73 | 462.62 N | 354.23 E | 501.36 | 27.59 |
| 4148.00 | 84.85 | 1.00 | 3923.42 | 485.51 N | 354.23 E | 525.25 | 29.11 |
| 4180.00 | 87.75 | 1.13 | 3944.11 | 508.40 N | 354.23 E | 549.14 | 30.63 |
| 4212.00 | 90.65 | 1.26 | 3964.80 | 531.29 N | 354.23 E | 573.03 | 32.15 |
| 4244.00 | 93.55 | 1.39 | 3985.49 | 554.18 N | 354.23 E | 596.92 | 33.67 |
| 4276.00 | 96.45 | 1.52 | 4006.18 | 577.07 N | 354.23 E | 620.81 | 35.19 |
| 4308.00 | 99.35 | 1.65 | 4026.87 | 600.00 N | 354.23 E | 644.70 | 36.71 |
| 4340.00 | 102.25 | 1.78 | 4047.56 | 622.89 N | 354.23 E | 668.59 | 38.23 |
| 4372.00 | 105.15 | 1.91 | 4068.25 | 645.78 N | 354.23 E | 692.48 | 39.75 |
| 4404.00 | 108.05 | 2.04 | 4088.94 | 668.67 N | 354.23 E | 716.37 | 41.27 |
| 4436.00 | 110.95 | 2.17 | 4109.63 | 691.56 N | 354.23 E | 740.26 | 42.79 |
| 4468.00 | 113.85 | 2.30 | 4130.32 | 714.45 N | 354.23 E | 764.15 | 44.31 |
| 4500.00 | 116.75 | 2.43 | 4151.01 | 737.34 N | 354.23 E | 788.04 | 45.83 |
| 4532.00 | 119.65 | 2.56 | 4171.70 | 760.23 N | 354.23 E | 811.93 | 47.35 |
| 4564.00 | 122.55 | 2.69 | 4192.39 | 783.12 N | 354.23 E | 835.82 | 48.87 |
| 4596.00 | 125.45 | 2.82 | 4213.08 | 806.01 N | 354.23 E | 859.71 | 50.39 |
| 4628.00 | 128.35 | 2.95 | 4233.77 | 828.90 N | 354.23 E | 883.60 | 51.91 |
| 4660.00 | 131.25 | 3.08 | 4254.46 | 851.79 N | 354.23 E | 907.49 | 53.43 |
| 4692.00 | 134.15 | 3.21 | 4275.15 | 874.68 N | 354.23 E | 931.38 | 54.95 |
| 4724.00 | 137.05 | 3.34 | 4295.84 | 897.57 N | 354.23 E | 955.27 | 56.47 |
| 4756.00 | 139.95 | 3.47 | 4316.53 | 920.46 N | 354.23 E | 979.16 | 57.99 |
| 4788.00 | 142.85 | 3.60 | 4337.22 | 943.35 N | 354.23 E | 1003.05 | 59.51 |
| 4820.00 | 145.75 | 3.73 | 4357.91 | 966.24 N | 354.23 E | 1026.94 | 61.03 |
| 4852.00 | 148.65 | 3.86 | 4378.60 | 989.13 N | 354.23 E | 1050.83 | 62.55 |
| 4884.00 | 151.55 | 3.99 | 4399.29 | 1012.02 N | 354.23 E | 1074.72 | 64.07 |
| 4916.00 | 154.45 | 4.12 | 4419.98 | 1034.91 N | 354.23 E | 1098.61 | 65.59 |
| 4948.00 | 157.35 | 4.25 | 4440.67 | 1057.80 N | 354.23 E | 1122.50 | 67.11 |
| 4980.00 | 160.25 | 4.38 | 4461.36 | 1080.69 N | 354.23 E | 1146.39 | 68.63 |
| 5012.00 | 163.15 | 4.51 | 4482.05 | 1103.58 N | 354.23 E | 1170.28 | 70.15 |
| 5044.00 | 166.05 | 4.64 | 4502.74 | 1126.47 N | 354.23 E | 1194.17 | 71.67 |
| 5076.00 | 168.95 | 4.77 | 4523.43 | 1149.36 N | 354.23 E | 1218.06 | 73.19 |
| 5108.00 | 171.85 | 4.90 | 4544.12 | 1172.25 N | 354.23 E | 1241.95 | 74.71 |
| 5140.00 | 174.75 | 5.03 | 4564.81 | 1195.14 N | 354.23 E | 1265.84 | 76.23 |
| 5172.00 | 177.65 | 5.16 | 4585.50 | 1218.03 N | 354.23 E | 1289.73 | 77.75 |
| 5204.00 | 180.55 | 5.29 | 4606.19 | 1240.92 N | 354.23 E | 1313.62 | 79.27 |
| 5236.00 | 183.45 | 5.42 | 4626.88 | 1263.81 N | 354.23 E | 1337.51 | 80.79 |
| 5268.00 | 186.35 | 5.55 | 4647.57 | 1286.70 N | 354.23 E | 1361.40 | 82.31 |
| 5300.00 | 189.25 | 5.68 | 4668.26 | 1309.59 N | 354.23 E | 1385.29 | 83.83 |
| 5332.00 | 192.15 | 5.81 | 4688.95 | 1332.48 N | 354.23 E | 1409.18 | 85.35 |
| 5364.00 | 195.05 | 5.94 | 4709.64 | 1355.37 N | 354.23 E | 1433.07 | 86.87 |
| 5396.00 | 197.95 | 6.07 | 4730.33 | 1378.26 N | 354.23 E | 1456.96 | 88.39 |
| 5428.00 | 200.85 | 6.20 | 4751.02 | 1401.15 N | 354.23 E | 1480.85 | 89.91 |
| 5460.00 | 203.75 | 6.33 | 4771.71 | 1424.04 N | 354.23 E | 1504.74 | 91.43 |
| 5492.00 | 206.65 | 6.46 | 4792.40 | 1446.93 N | 354.23 E | 1528.63 | 92.95 |
| 5524.00 | 209.55 | 6.59 | 4813.09 | 1469.82 N | 354.23 E | 1552.52 | 94.47 |
| 5556.00 | 212.45 | 6.72 | 4833.78 | 1492.71 N | 354.23 E | 1576.41 | 95.99 |
| 5588.00 | 215.35 | 6.85 | 4854.47 | 1515.60 N | 354.23 E | 1600.30 | 97.51 |
| 5620.00 | 218.25 | 6.98 | 4875.16 | 1538.49 N | 354.23 E | 1624.19 | 99.03 |
| 5652.00 | 221.15 | 7.11 | 4895.85 | 1561.38 N | 354.23 E | 1648.08 | 100.55 |
| 5684.00 | 224.05 | 7.24 | 4916.54 | 1584.27 N | 354.23 E | 1671.97 | 102.07 |
| 5716.00 | 226.95 | 7.37 | 4937.23 | 1607.16 N | 354.23 E | 1695.86 | 103.59 |
| 5748.00 | 229.85 | 7.50 | 4957.92 | 1630.05 N | 354.23 E | 1719.75 | 105.11 |
| 5780.00 | 232.75 | 7.63 | 4978.61 | 1652.94 N | 354.23 E | 1743.64 | 106.63 |
| 5812.00 | 235.65 | 7.76 | 4999.30 | 1675.83 N | 354.23 E | 1767.53 | 108.15 |
| 5844.00 | 238.55 | 7.89 | 5019.99 | 1698.72 N | 354.23 E | 1791.42 | 109.67 |
| 5876.00 | 241.45 | 8.02 | 5040.68 | 1721.61 N | 354.23 E | 1815.31 | 111.19 |
| 5908.00 | 244.35 | 8.15 | 5061.37 | 1744.50 N | 354.23 E | 1839.20 | 112.71 |
| 5940.00 | 247.25 | 8.28 | 5082.06 | 1767.39 N | 354.23 E | 1863.09 | 114.23 |
| 5972.00 | 250.15 | 8.41 | 5102.75 | 1790.28 N | 354.23 E | 1886.98 | 115.75 |
| 6004.00 | 253.05 | 8.54 | 5123.44 | 1813.17 N | 354.23 E | 1910.87 | 117.27 |
| 6036.00 | 255.95 | 8.67 | 5144.13 | 1836.06 N | 354.23 E | 1934.76 | 118.79 |
| 6068.00 | 258.85 | 8.80 | 5164.82 | 1858.95 N | 354.23 E | 1958.65 | 120.31 |
| 6100.00 | | | | | | | |

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|---------|-------|--------|---------|-----------|----------|---------|-------|
| 3764.00 | 50.85 | 0.93 | 3675.44 | 212.08 N | 354.51 E | 238.77 | 11.62 |
| 3795.00 | 53.77 | 0.09 | 3694.39 | 236.61 N | 354.73 E | 263.24 | 9.65 |
| 3827.00 | 57.13 | 359.57 | 3712.54 | 262.96 N | 354.64 E | 289.51 | 10.60 |
| 3859.00 | 60.26 | 359.02 | 3729.16 | 290.29 N | 354.31 E | 316.74 | 9.89 |
| 3891.00 | 63.37 | 358.79 | 3744.27 | 318.49 N | 353.77 E | 344.81 | 9.75 |
| 3922.00 | 66.41 | 358.94 | 3757.43 | 346.55 N | 353.21 E | 372.74 | 9.80 |
| 3954.00 | 69.26 | 359.46 | 3769.50 | 376.18 N | 352.80 E | 402.25 | 9.03 |
| 3986.00 | 71.69 | 359.49 | 3780.19 | 406.34 N | 352.52 E | 432.30 | 7.60 |
| 4017.00 | 74.05 | 359.72 | 3789.32 | 435.96 N | 352.32 E | 461.82 | 7.64 |
| 4049.00 | 75.20 | 0.79 | 3797.81 | 466.81 N | 352.46 E | 492.59 | 4.83 |
| 4081.00 | 77.06 | 1.25 | 3805.48 | 497.87 N | 353.01 E | 523.60 | 5.97 |
| 4112.00 | 80.59 | 1.13 | 3811.48 | 528.28 N | 353.65 E | 553.96 | 11.40 |
| 4207.00 | 87.91 | 0.25 | 3821.00 | 622.73 N | 354.78 E | 648.22 | 7.75 |
| 4293.00 | 89.17 | 359.69 | 3823.19 | 708.70 N | 354.74 E | 733.93 | 1.61 |
| 4325.00 | 89.08 | 359.38 | 3823.68 | 740.69 N | 354.48 E | 765.81 | 0.99 |
| 4420.00 | 91.08 | 0.25 | 3823.55 | 835.68 N | 354.17 E | 860.49 | 2.29 |
| 4515.00 | 91.79 | 0.98 | 3821.18 | 930.65 N | 355.19 E | 955.25 | 1.08 |
| 4609.00 | 90.15 | 1.27 | 3819.58 | 1024.61 N | 357.03 E | 1049.08 | 1.77 |
| 4704.00 | 90.40 | 1.00 | 3819.13 | 1119.59 N | 358.90 E | 1143.92 | 0.38 |
| 4798.00 | 89.20 | 0.40 | 3819.46 | 1213.58 N | 360.04 E | 1237.72 | 1.43 |
| 4893.00 | 88.46 | 0.33 | 3821.40 | 1308.56 N | 360.65 E | 1332.46 | 0.78 |
| 4988.00 | 89.63 | 0.22 | 3822.98 | 1403.55 N | 361.10 E | 1427.20 | 1.24 |
| 5079.00 | 90.06 | 359.56 | 3823.22 | 1494.54 N | 360.93 E | 1517.92 | 0.86 |
| 5170.00 | 88.37 | 358.84 | 3824.47 | 1585.52 N | 359.66 E | 1608.53 | 2.02 |
| 5261.00 | 88.25 | 358.22 | 3827.16 | 1676.45 N | 357.33 E | 1699.01 | 0.70 |
| 5352.00 | 88.58 | 358.92 | 3829.67 | 1767.39 N | 355.06 E | 1789.50 | 0.86 |
| 5442.00 | 89.26 | 0.21 | 3831.37 | 1857.37 N | 354.38 E | 1879.16 | 1.62 |
| 5533.00 | 90.55 | 1.19 | 3831.52 | 1948.36 N | 355.50 E | 1969.96 | 1.78 |
| 5625.00 | 90.18 | 0.36 | 3830.92 | 2040.35 N | 356.74 E | 2061.77 | 0.99 |
| 5717.00 | 90.46 | 0.46 | 3830.41 | 2132.34 N | 357.40 E | 2153.54 | 0.32 |
| 5811.00 | 90.98 | 359.67 | 3829.22 | 2226.33 N | 357.50 E | 2247.26 | 1.01 |
| 5905.00 | 90.99 | 359.55 | 3827.60 | 2320.32 N | 356.86 E | 2340.92 | 0.13 |
| 6000.00 | 90.09 | 0.36 | 3826.71 | 2415.31 N | 356.78 E | 2435.63 | 1.28 |
| 6095.00 | 89.60 | 0.53 | 3826.97 | 2510.31 N | 357.52 E | 2530.40 | 0.55 |
| 6190.00 | 89.85 | 0.10 | 3827.43 | 2605.31 N | 358.05 E | 2625.15 | 0.52 |
| 6285.00 | 89.94 | 359.92 | 3827.60 | 2700.31 N | 358.06 E | 2719.87 | 0.22 |
| 6380.00 | 91.51 | 359.96 | 3826.40 | 2795.30 N | 357.96 E | 2814.57 | 1.65 |
| 6475.00 | 91.45 | 359.71 | 3823.95 | 2890.26 N | 357.69 E | 2909.23 | 0.27 |
| 6570.00 | 92.22 | 359.25 | 3820.91 | 2985.21 N | 356.83 E | 3003.83 | 0.94 |
| 6665.00 | 91.91 | 359.37 | 3817.49 | 3080.14 N | 355.68 E | 3098.39 | 0.35 |
| 6760.00 | 91.17 | 359.35 | 3814.94 | 3175.10 N | 354.62 E | 3192.99 | 0.78 |
| 6855.00 | 89.97 | 0.11 | 3813.99 | 3270.09 N | 354.18 E | 3287.66 | 1.50 |
| 6950.00 | 90.68 | 359.96 | 3813.46 | 3365.09 N | 354.24 E | 3382.38 | 0.76 |
| 7045.00 | 90.03 | 0.94 | 3812.87 | 3460.08 N | 354.99 E | 3477.15 | 1.23 |
| 7140.00 | 89.29 | 0.18 | 3813.43 | 3555.08 N | 355.91 E | 3571.93 | 1.12 |
| 7236.00 | 89.75 | 0.48 | 3814.23 | 3651.07 N | 356.46 E | 3667.68 | 0.57 |
| 7331.00 | 90.06 | 0.14 | 3814.38 | 3746.07 N | 356.97 E | 3762.44 | 0.48 |
| 7426.00 | 89.85 | 0.49 | 3814.46 | 3841.07 N | 357.49 E | 3857.19 | 0.43 |
| 7521.00 | 90.37 | 0.04 | 3814.28 | 3936.07 N | 357.94 E | 3951.94 | 0.72 |
| 7616.00 | 89.63 | 359.87 | 3814.28 | 4031.06 N | 357.87 E | 4046.66 | 0.80 |
| 7711.00 | 91.14 | 359.31 | 3813.64 | 4126.06 N | 357.19 E | 4141.31 | 1.70 |
| 7806.00 | 92.24 | 359.84 | 3810.84 | 4221.01 N | 356.49 E | 4235.93 | 1.29 |
| 7901.00 | 90.61 | 0.13 | 3808.47 | 4315.98 N | 356.46 E | 4330.61 | 1.74 |
| 7996.00 | 90.18 | 359.62 | 3807.81 | 4410.98 N | 356.26 E | 4425.31 | 0.70 |
| 8076.00 | 90.46 | 359.22 | 3807.36 | 4490.97 N | 355.45 E | 4505.01 | 0.62 |
| 8130.00 | 90.46 | 359.22 | 3806.92 | 4544.96 N | 354.71 E | 4558.78 | 0.01 |

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 4.42 DEGREES (GRID)
A TOTAL CORRECTION OF 4.62 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 8130.00 FEET
IS 4558.78 FEET ALONG 4.46 DEGREES (GRID)**