



DDS Drill String Dynamics

WILD

| | |
|---|---|
| Country | : Australia |
| Field | : Casino |
| Location | : Lat: 38° 47' 13.03" South Long: 142° 41' 54.49" East |
| Well | : Casino-4 |
| Company | : Santos Ltd |
| Rig | : Ocean Patriot |
| LOCATION | |
| UTM Easting = 647,518.19 m UTM Northing = 5,705,495.28 m | Latitude : 38° 47' 13.03" South Longitude : 142° 41' 54.49" East |
| Other Services Directional Drilling | Company : Santos Ltd Rig : Ocean Patriot Well : Casino-4 Field : Casino Country : Australia DOE Number : |

| | | | | | |
|------------------------|---------------|-------------|-----------------------|-----------|-------------------|
| Permanent Datum | : LAT | Elevation : | 0.00 m | Elev. | KB |
| Log Measured From | : Drill Floor | 22.00 m | Above Permanent Datum | | DF 22.00 m |
| Drilling Measured From | : Drill Floor | TIME LOG | | | GL 70.80 m |
| | | | | | |
| Depth Logged | : 92.78 m | To | 1,825.00 m | Job No. : | ALU-FE-0003350533 |
| Date Logged | : 07-May-05 | To | 21-May-05 | | |
| Total Depth MD | : 1,825.00 m | TVD: | 1,822.68 m | | |
| Spud Date | : 07-May-05 | Plot Type | : Final | | |
| | | Plot Date | : 29-Jun-05 | | |

[illegible]

| WELL INFORMATION | | | | | |
|---------------------------------|-------------------|---------------------|---------------------|--|--|
| MWD Run Number | 200 | 300 | 400 | | |
| Date run completed | 14-May-05 | 16-May-05 | 19-May-05 | | |
| Rig Bit Number | 3 | 4 | 5 | | |
| Bit Size (mm) | 311 | 311 | 311 | | |
| Tool Nominal OD (mm) | 203 | 203 | 203 | | |
| Log Start Depth (MD, m) | 742.0 | 1,304.0 | 1,761.0 | | |
| Log End Depth (MD, m) | 1,304.0 | 1,761.0 | 1,825.0 | | |
| Drill or Wipe | Drilling | Drilling | Drilling | | |
| Drill/Wipe Start Date and Time | 13-May-05 05:18 | 15-May-05 05:44 | 18-May-05 22:00 | | |
| Drill/Wipe End Date and Time | 14-May-05 14:30 | 16-May-05 00:09 | 19-May-05 01:48 | | |
| Min Inc (deg) @ Depth (MD, m) | 0.53 @ 842.32 | 4.15 @ 1,616.98 | 4.28 @ 1,805 | | |
| Max Inc (deg) @ Depth (MD, m) | 4.61 @ 1,284.20 | 4.65 @ 1,300.98 | 4.46 @ 1,760.80 | | |
| Bit TFA(in2) / Bit Type | 0.92 / HC MX-03DX | 1.10 / Smith MA89PX | 1.10 / Smith MA89PX | | |
| Flow Rate (gpm) | 980 | 887 | 820 | | |
| Max AV (mpm) / CV (mpm) @ MWD | 86.8 / 135.0 | 82.0 / 157.2 | 74.5 / 79.8 | | |
| Fluid Type | KCl/Polymer | KCl/Polymer | KCl/Polymer | | |
| Density (sg) / Viscosity (spqt) | 1.2 / 54 | 1.2 / 54 | 1.3 / 70 | | |
| Filtrate CL (ppm) | 27,000 | 38,500 | 40,000 | | |
| pH / Fluid Loss (mptm) | 8.2 / 4.2 | 9.0 / 4.0 | 9.0 / 3.6 | | |
| PV (cp) / YP (lhf2) | 17 / 29 | 21 / 37 | 23 / 17 | | |
| % Solids / % Sand | 10 / 1 | 11.6 / 0.5 | 13 / 0.4 | | |
| % Oil / Oil:Water Ratio | N/A / N/A | N/A / N/A | N/A / N/A | | |
| Rm @ Measured Temp (degC) | 0.16 @ 25.3 | 0.12 @ 22.8 | 0.14 @ 17.8 | | |
| Rmf @ Measured Temp (degC) | 0.13 @ 25.6 | 0.10 @ 23.3 | 0.09 @ 17.8 | | |
| Rmc @ Measured Temp (degC) | 0.29 @ 24.4 | 0.19 @ 23.3 | 0.36 @ 17.8 | | |
| Max Tool Temp (degC) / Source | 61.0 / EWR | 67.7 / EWR-P4 | 65.0 / HCIM | | |
| Rm @ Max Tool Temp (degC) | 0.09 @ 61.0 | 0.06 @ 67.7 | 0.06 @ 65.0 | | |
| Lead MWD Engineer | A. Rule | A. Rule | A. Rule | | |
| Customer Representative | R. King | R. King | C. Wise | | |

SENSOR INFORMATION

Downhole Processor Information

| | | | | | |
|------------------------------|-----------------|-----------------|-----------------|--|--|
| Tool Type | HCIM | HCIM | HCIM | | |
| Software Version | 68.18 | 68.18 | 68.18 | | |
| Sub Serial Number | 198838 | 198838 | 198838 | | |
| Insert Serial Number | 163155 | 163155 | 110349 | | |
| Logging String Serial Number | DM90072522 | DM90072522 | DM90072523 | | |
| Date and Time Initialized | 12-May-05 19:10 | 14-May-05 21:17 | 18-May-05 16:42 | | |
| Date and Time Read | 14-May-05 20:39 | 16-May-05 19:22 | 19-May-05 10:09 | | |

Directional Sensor Information

| | | | | | |
|-----------------------------|-------|-------|----------|--|--|
| Tool Type | DM | DM | DM | | |
| Distance From Bit (m) | 19.18 | 19.22 | 19.10 | | |
| Software Version | 3.15 | 3.15 | 3.15 | | |
| Sub Serial Number | 1 | 1 | 128402 | | |
| Sonde Serial Number | 87896 | 87896 | 10581139 | | |
| Sensor ID Number | N/A | N/A | N/A | | |
| Survey String Serial Number | N/A | N/A | N/A | | |
| Toolface Offset (deg) | 0 | 0 | 0 | | |

Gamma Ray Sensor Information

| | | | | | |
|------------------------------|--------|--------|----------|--|--|
| Tool Type | DGR | DGR | DGR | | |
| Distance From Bit (m) | 10.31 | 10.35 | 10.34 | | |
| Recorded Sample Period (sec) | 12 | 12 | 12 | | |
| Software Version | N/A | N/A | N/A | | |
| Sub Serial Number | 059984 | 059984 | 10603326 | | |
| Insert/Sonde Serial Number | 151078 | 151078 | 084171 | | |

Drillstring Dynamics Sensor Information

| | | | | | |
|------------------------------|--------|--------|--|--|--|
| Tool Type | DDS | DDS | | | |
| Distance From Bit (m) | 0 | 0 | | | |
| Recorded Sample Period (sec) | 12 | 12 | | | |
| Software Version | .50 | .50 | | | |
| Sub Serial Number | 159984 | 159984 | | | |
| Insert Serial Number | 151078 | 151078 | | | |
| Sensor ID Number | 126 | 126 | | | |

REMARKS

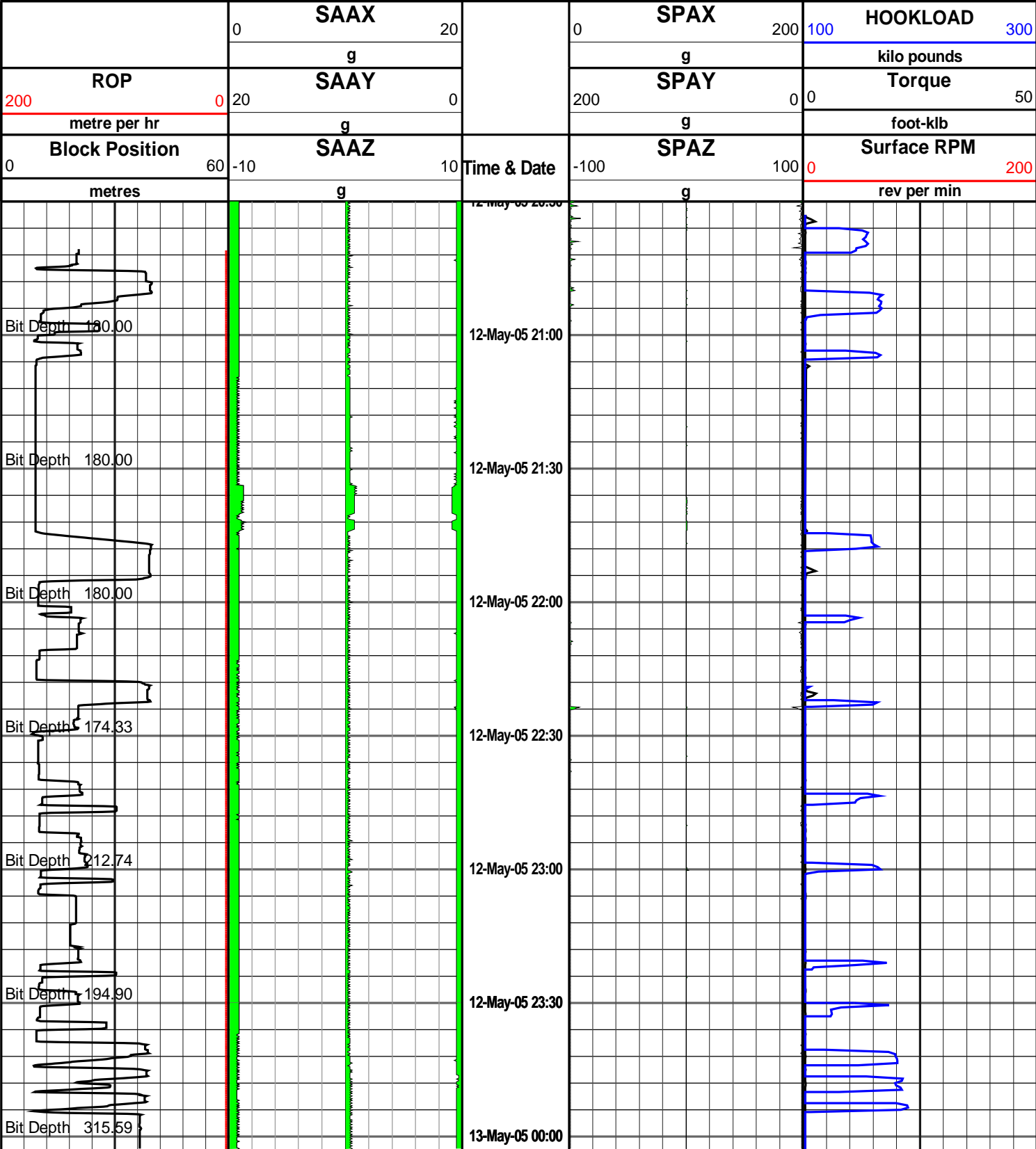
1. All depths are bit depths and referenced to the drillers pipe tally
2. AV/CV is calculated at the MWD collar using the Powere Law for water based muds and the Bingham's Plastic Law for oil based muds.
3. Curve mnemonics are:
SROP - Smoothed Rate of Penetration, m/hr (Sperry)
SAAX - Smoothed Average X-Axis Accelerometer, g's (Sperry)
SAAY - Smoothed Average Y-Axis Accelerometer, g's (Sperry)
SAAZ - Smoothed Average Z-Axis Accelerometer, g's (Sperry)
SPAX - Smoothed Peak X-Axis Accelerometer, g's (Sperry)
SPAY - Smoothed Peak Y-Axis Accelerometer, g's (Sperry)
SPAZ - Smoothed Peak Z-Axis Accelerometer, g's (Sperry)
HKLD - Surface Hookload, klb (Sperry)
RPM - Surface Drillstring Revolutions Per Minute, rpm (GeoServices)
TORQUE - Surface Torque, ft-klbs (Sperry)
4. Interval 1761.0-1794.0 mMDRT was logged after coring.
5. SDL data not received from mudlogging company, data presented from SDS. No RPM data available.
6. DDS tool was not run on Run 400.
7. EMS Surveys were adjusted by Santos Ltd to correct for magnetic interference.

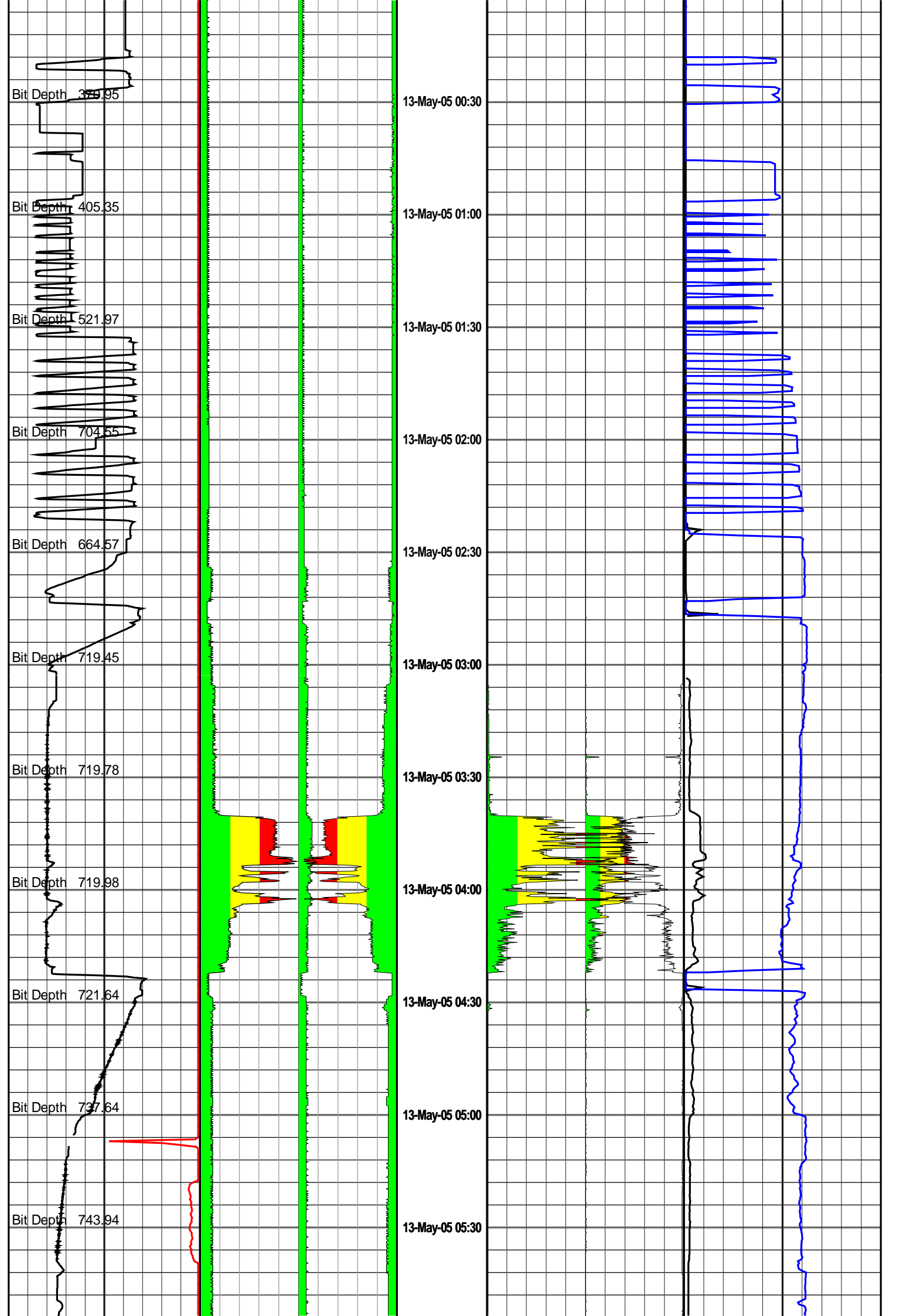
WARRANTY

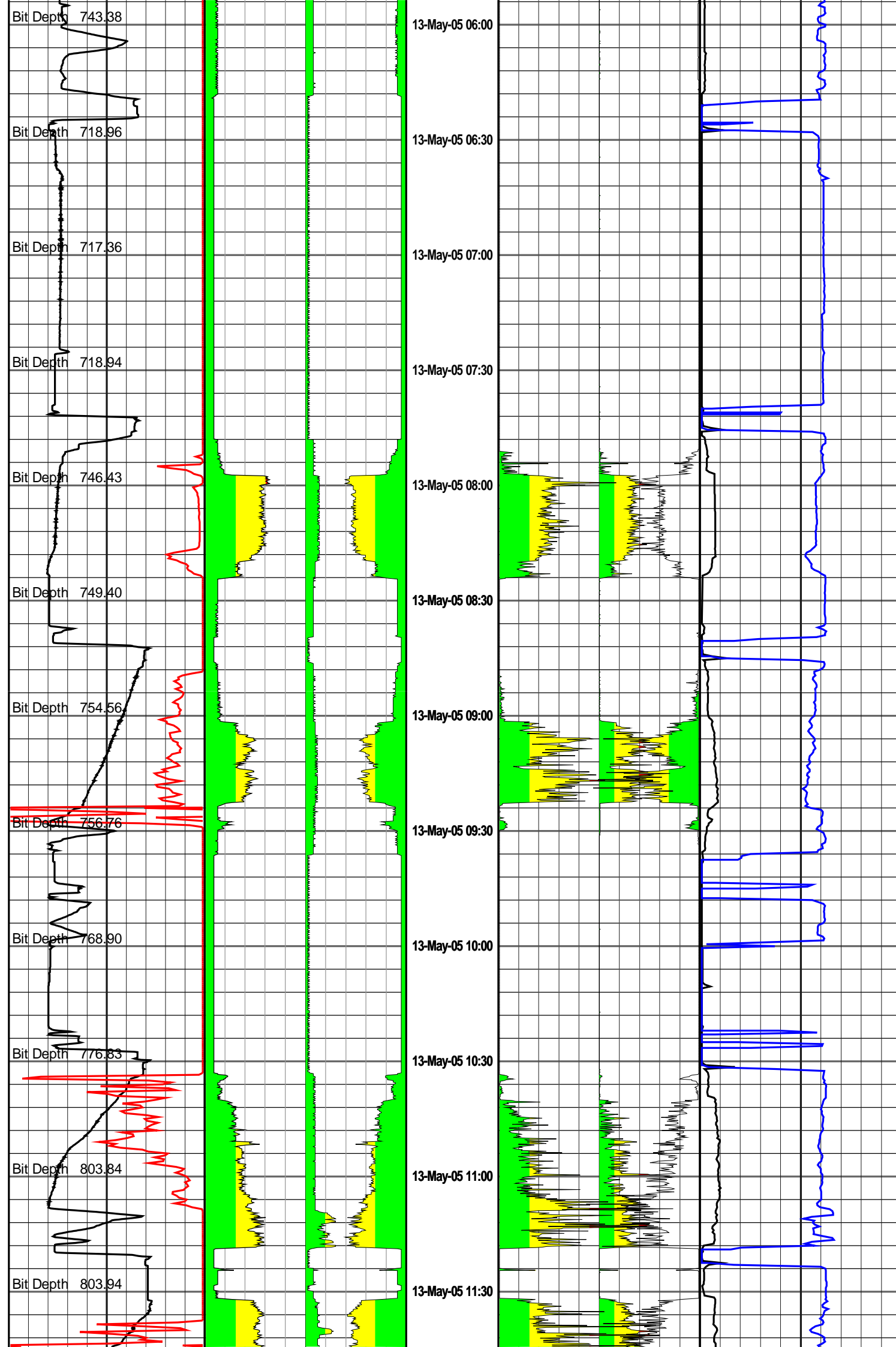
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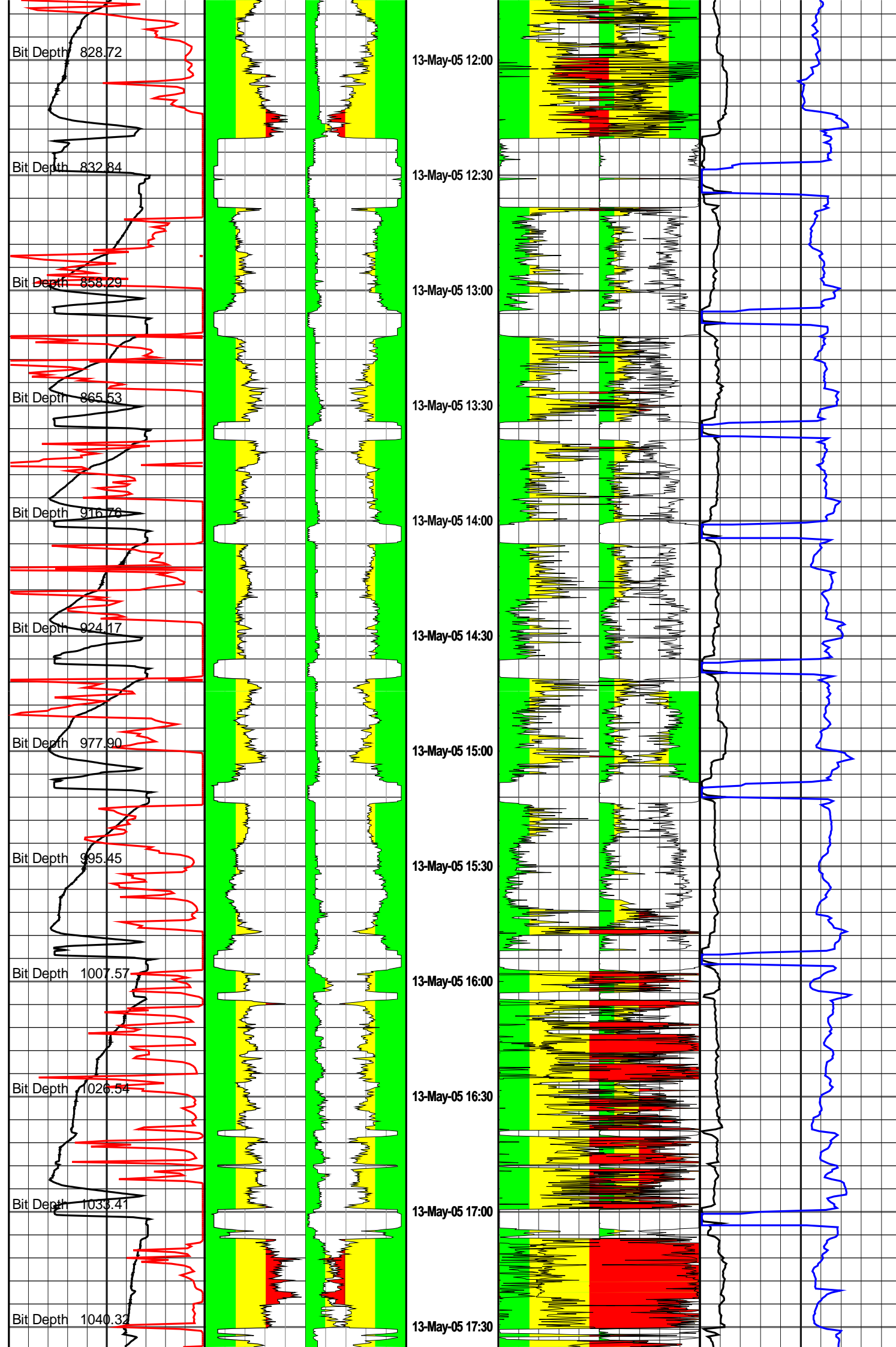
Run 200 : 311 mm Hole Section
Drilled from 742.0 to 1304.0 mMDRT

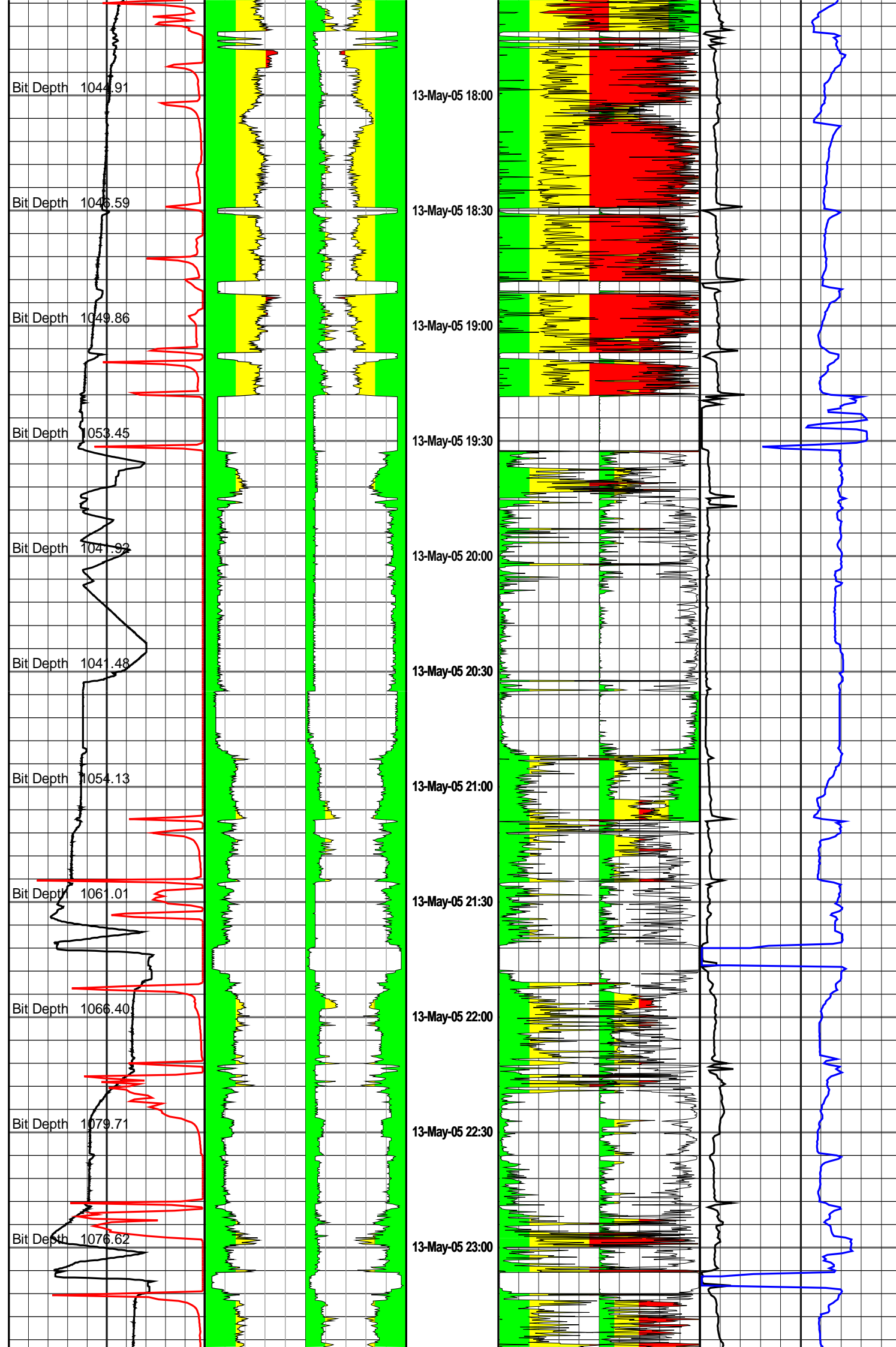
20:30 hrs 12th May to 21:00 hrs 14th May 2005

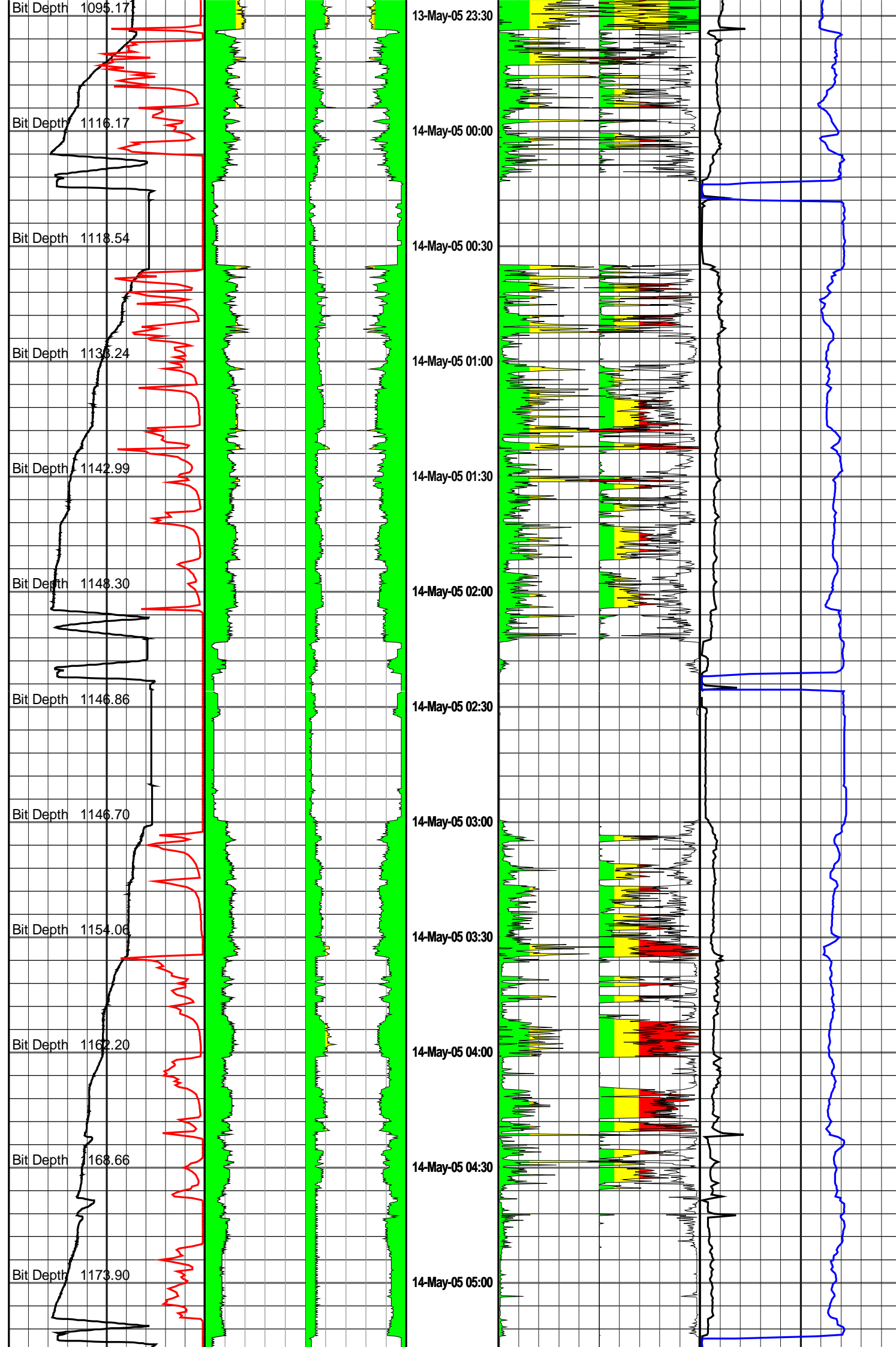


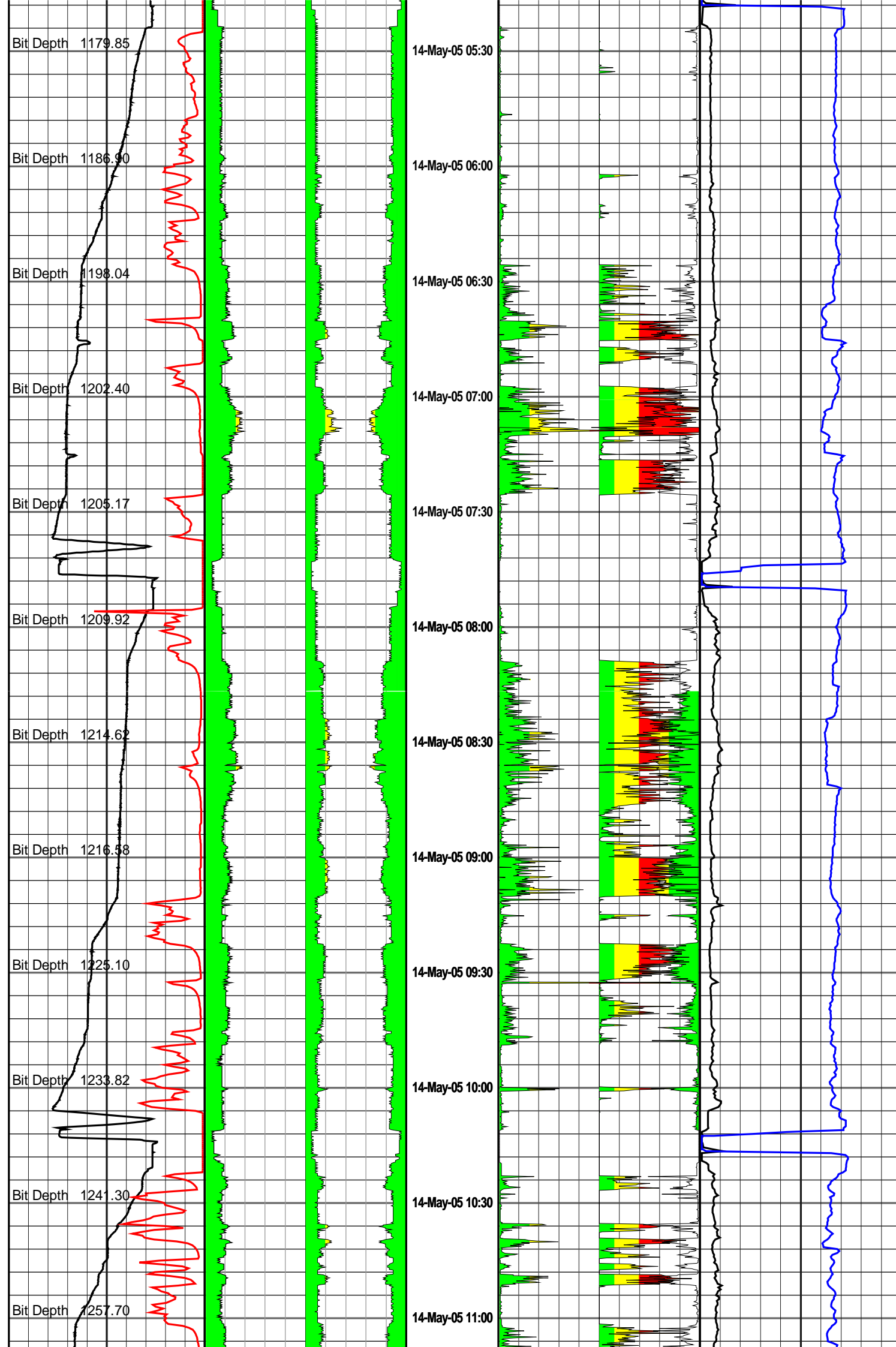


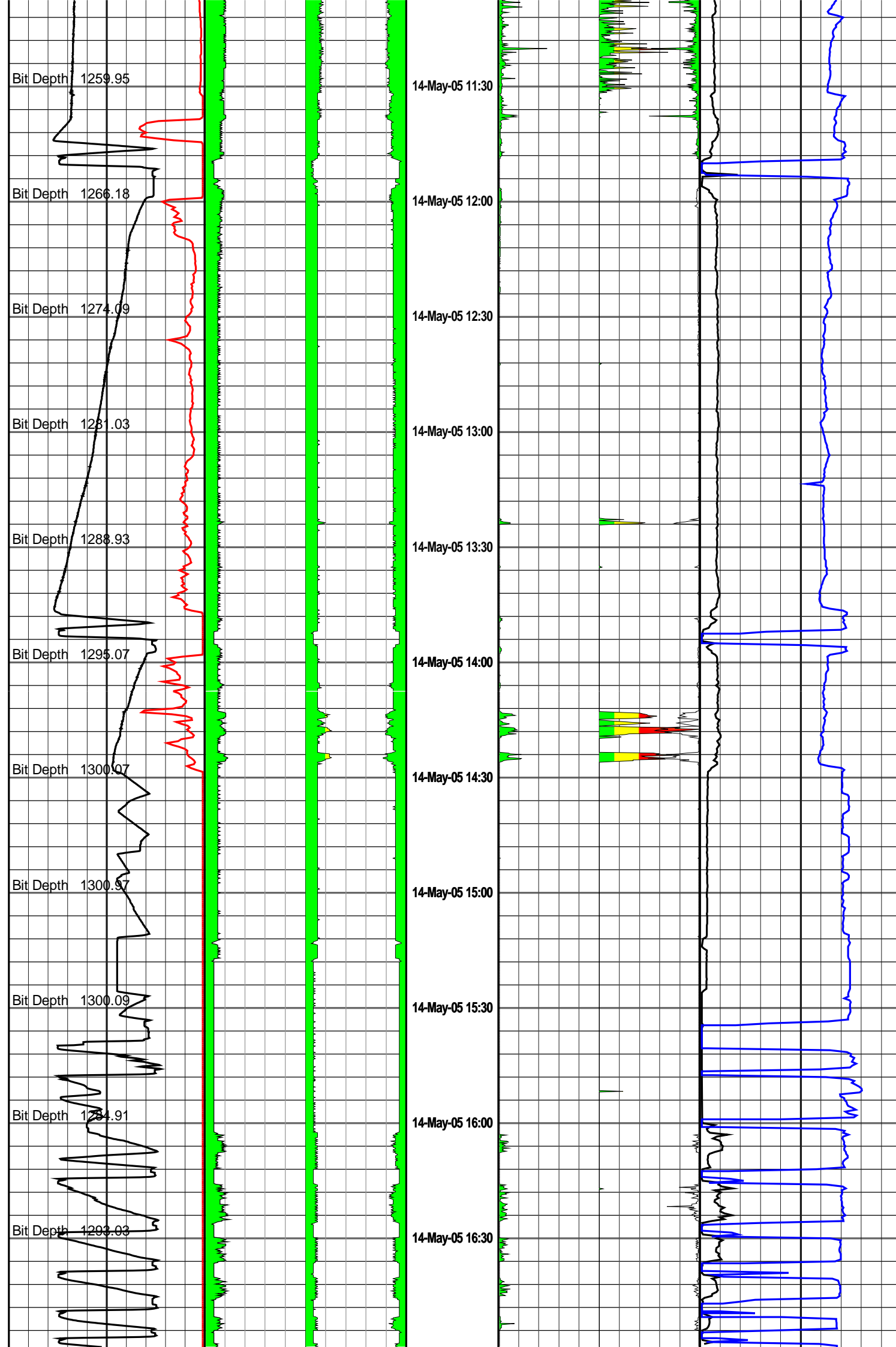


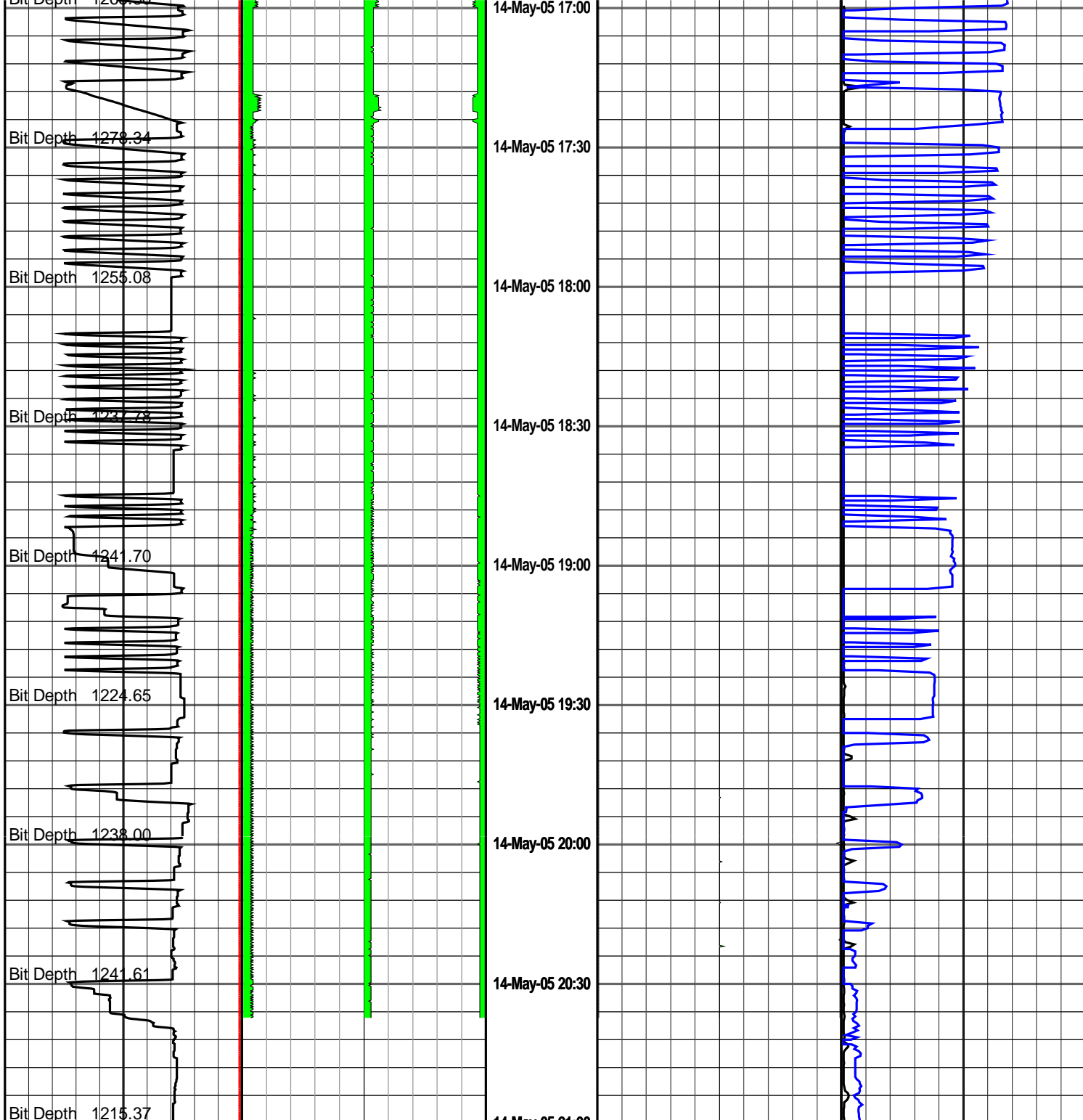












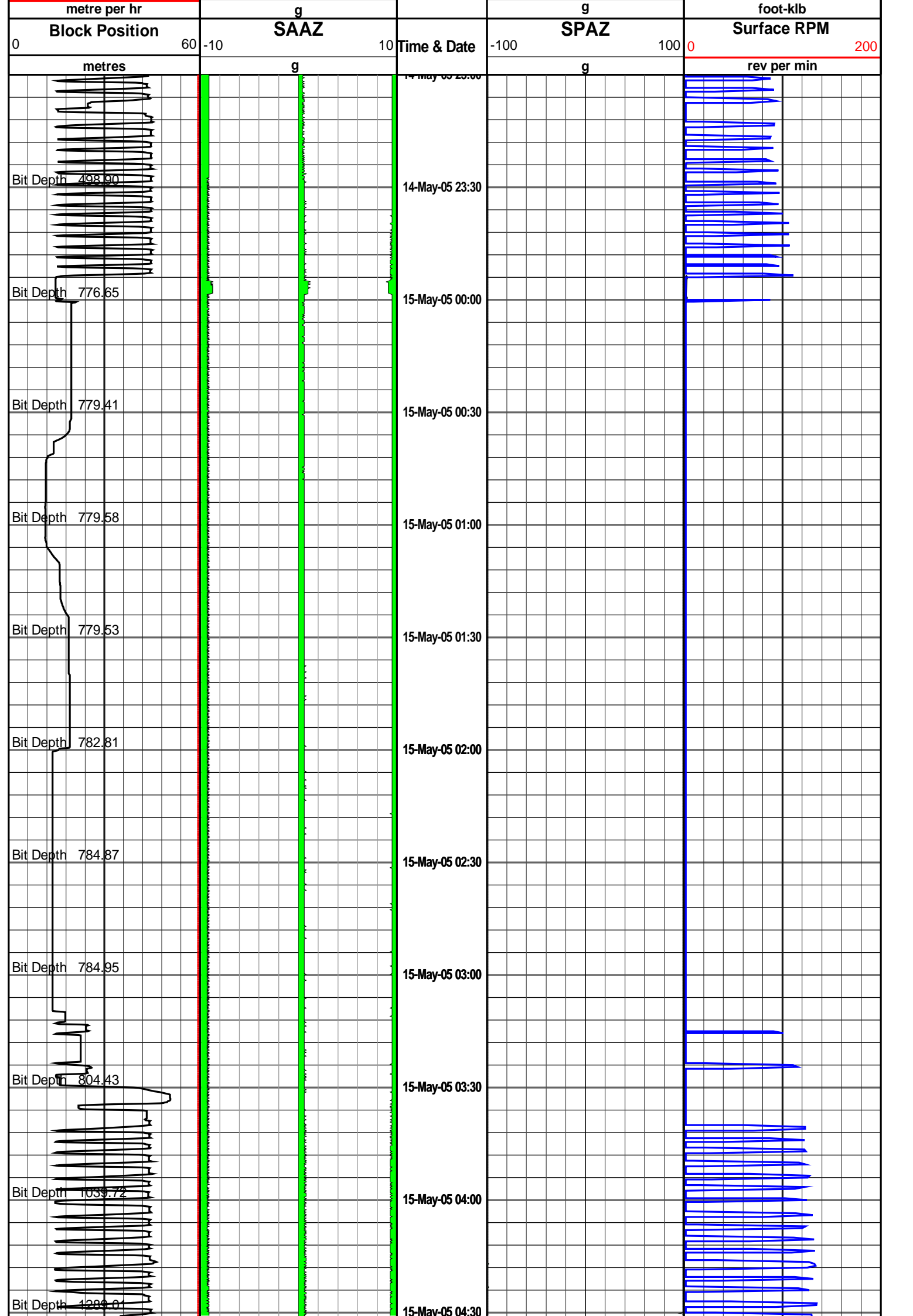
| | | | | | | | | | | | | |
|-----|----------------|----|-----|------|----|-------------|------|------|-----|-----|-------------|-----|
| 0 | Block Position | 60 | -10 | SAAZ | 10 | Time & Date | -100 | SPAZ | 100 | 0 | Surface RPM | 200 |
| | metres | | | g | | | | g | | | rev per min | |
| 200 | ROP | 0 | 20 | SAAY | 0 | | 200 | SPAY | 0 | 0 | Torque | 50 |
| | metre per hr | | | g | | | | g | | | foot-klb | |
| | | | 0 | SAAX | 20 | | 0 | SPAX | 200 | 100 | HOOKLOAD | 300 |
| | | | | g | | | | g | | | kilo pounds | |

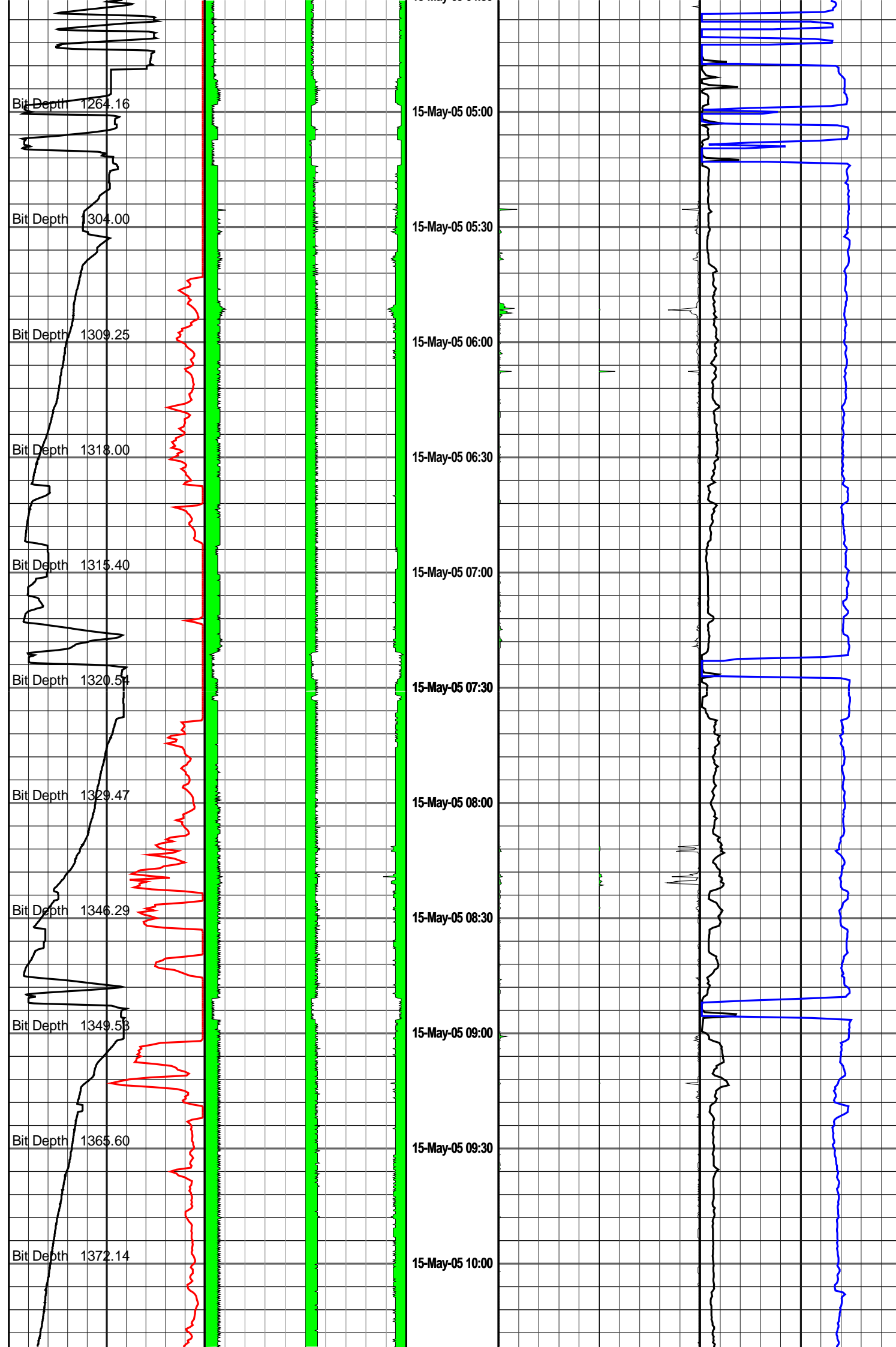
Run 300 : 311 mm Hole Section

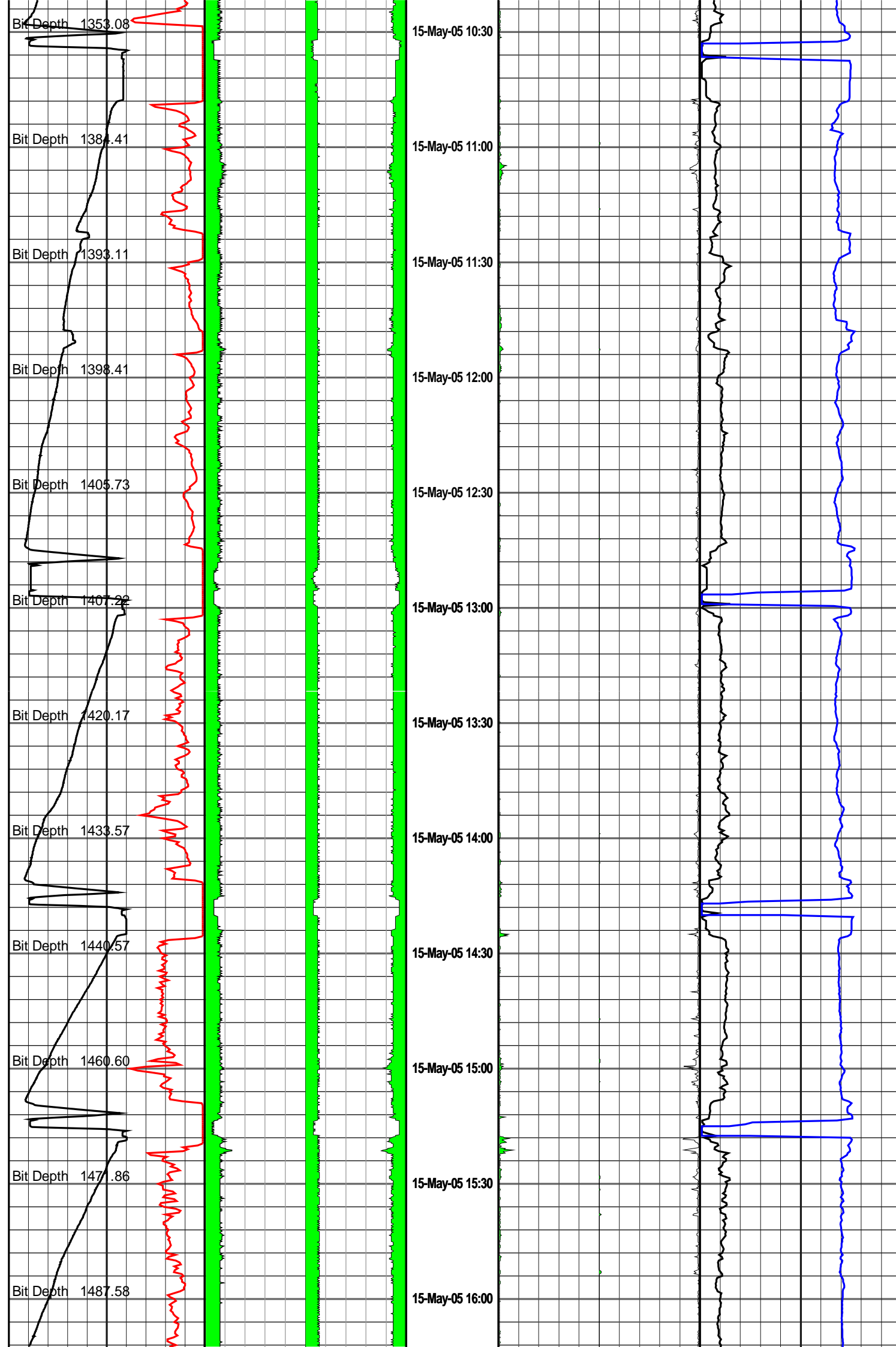
Drilled from 1304.0 - 1761.0 mMDRT

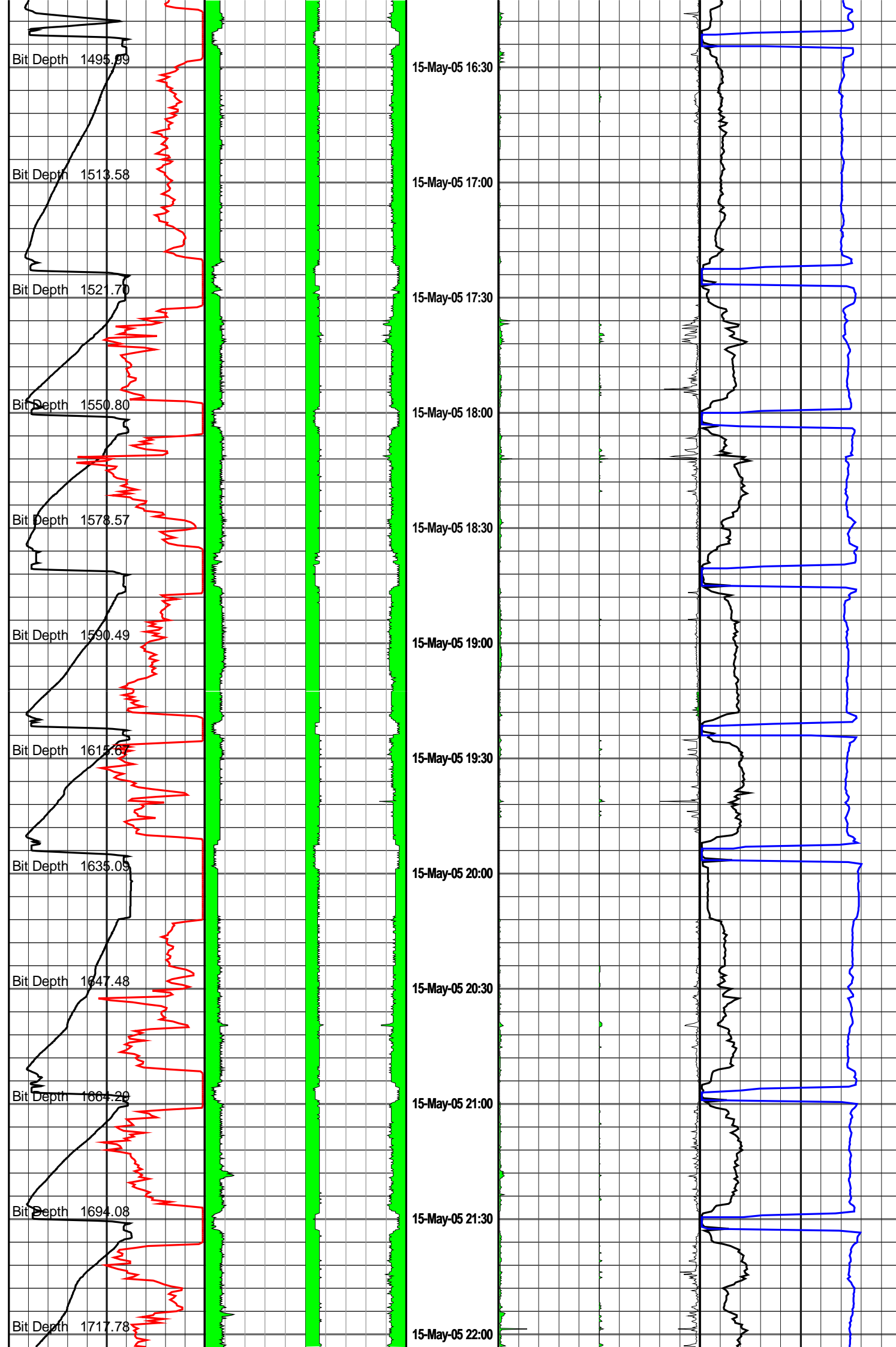
23:00 hrs 14th May to 08:00 hrs 16th May 2005

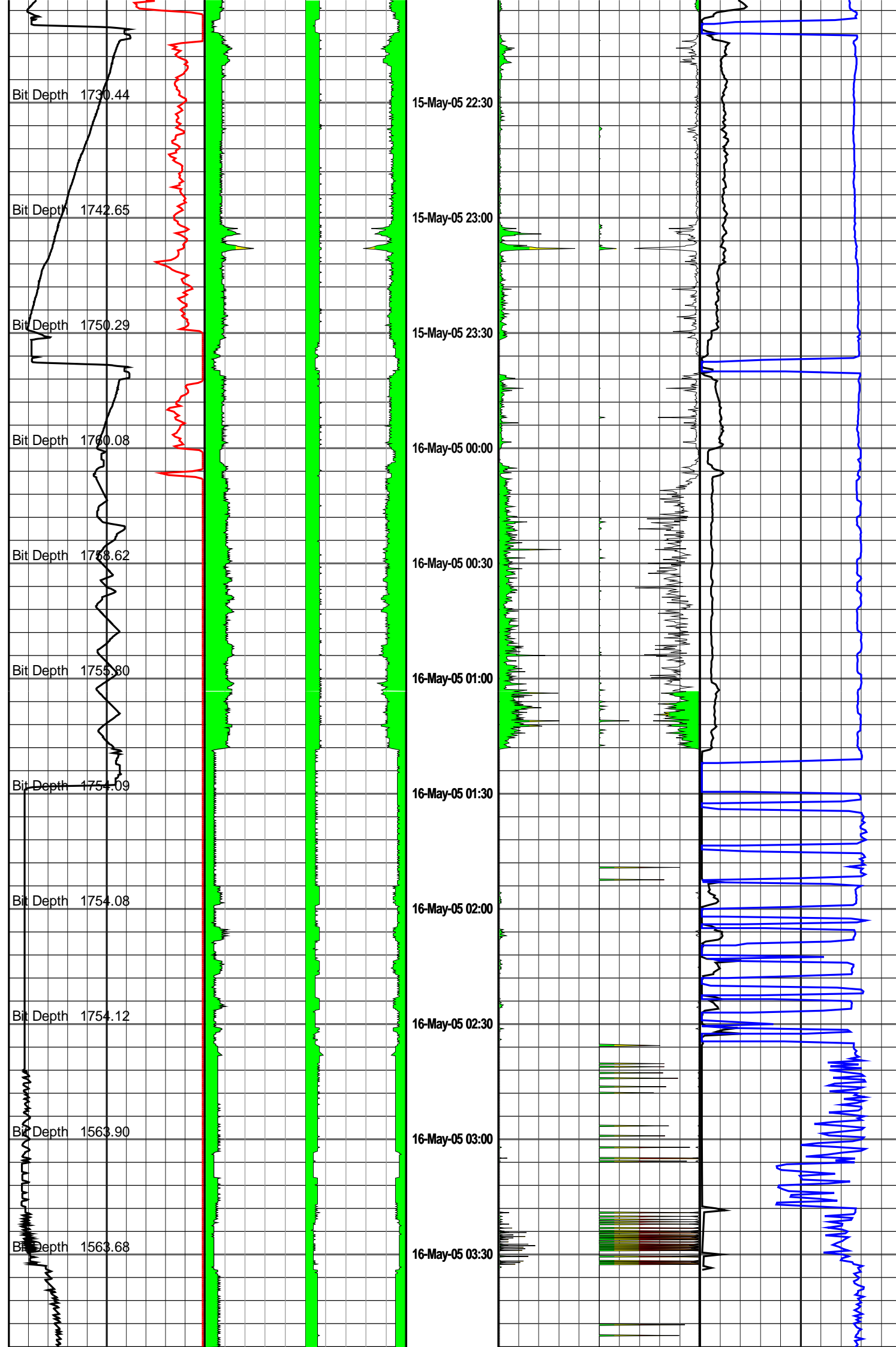
| | | | | | | | | | | |
|-----|-----|------|----|------|---|------|------|-----|-------------|-----|
| | 0 | SAAX | 20 | | 0 | SPAX | 200 | 100 | HOOKLOAD | 300 |
| | | g | | | | g | | | kilo pounds | |
| 200 | ROP | 0 | 20 | SAAY | 0 | 200 | SPAY | 0 | Torque | 50 |

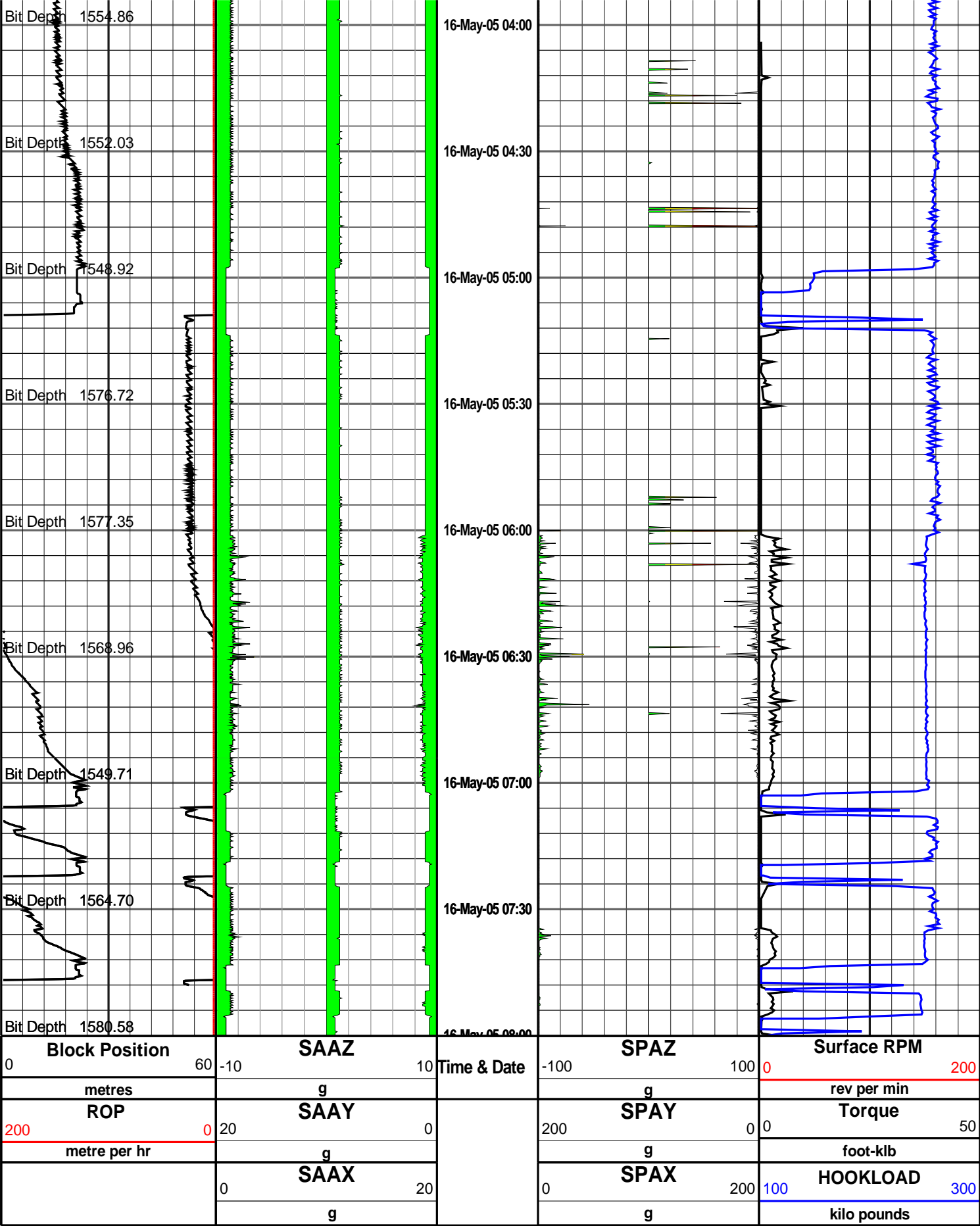














DIRECTIONAL SURVEY REPORT

Santos Ltd

Casino-4

Casino

Victoria

Australia

AU-FE-0003530535

RT to LAT = 22.0m. EMS Surveys to 734.4 mMDRT.

| <i>Measured Depth (metres)</i> | <i>Inclination (degrees)</i> | <i>Direction (degrees)</i> | <i>Vertical Depth (metres)</i> | <i>Latitude (metres)</i> | <i>Departure (metres)</i> | <i>Vertical Section (metres)</i> | <i>Dogleg (deg/30m)</i> |
|--|----------------------------------|--------------------------------|--|------------------------------|-------------------------------|--|-----------------------------|
| 137.400 | 0.00 | 0.00 | 137.400 | 0.000 N | 0.000 E | 0.000 | TIE-IN |
| 155.270 | 0.85 | 0.00 | 155.269 | 0.133 N | 0.000 E | 0.133 | 1.43 |
| 183.080 | 1.00 | 0.00 | 183.076 | 0.582 N | 0.000 E | 0.582 | 0.16 |
| 210.810 | 1.06 | 0.00 | 210.801 | 1.080 N | 0.000 E | 1.080 | 0.06 |
| 238.200 | 0.99 | 0.00 | 238.187 | 1.570 N | 0.000 E | 1.570 | 0.08 |
| 265.670 | 0.64 | 0.00 | 265.654 | 1.961 N | 0.000 E | 1.961 | 0.38 |
| 294.940 | 0.63 | 0.00 | 294.922 | 2.285 N | 0.000 E | 2.285 | 0.01 |
| 323.720 | 0.81 | 0.00 | 323.700 | 2.647 N | 0.000 E | 2.647 | 0.19 |
| 352.060 | 0.45 | 0.00 | 352.038 | 2.958 N | 0.000 E | 2.958 | 0.38 |
| 381.120 | 0.39 | 0.00 | 381.097 | 3.171 N | 0.000 E | 3.171 | 0.06 |
| 410.010 | 0.74 | 0.00 | 409.986 | 3.456 N | 0.000 E | 3.456 | 0.36 |
| 438.380 | 0.53 | 0.00 | 438.354 | 3.771 N | 0.000 E | 3.771 | 0.22 |
| 466.930 | 0.61 | 0.00 | 466.903 | 4.055 N | 0.000 E | 4.055 | 0.08 |
| 496.110 | 0.63 | 0.00 | 496.081 | 4.370 N | 0.000 E | 4.370 | 0.02 |
| 524.800 | 0.45 | 0.00 | 524.770 | 4.641 N | 0.000 E | 4.641 | 0.19 |
| 553.280 | 0.34 | 0.00 | 553.249 | 4.837 N | 0.000 E | 4.837 | 0.12 |
| 581.980 | 0.46 | 0.00 | 581.948 | 5.038 N | 0.000 E | 5.038 | 0.13 |
| 610.680 | 0.25 | 0.00 | 610.648 | 5.215 N | 0.000 E | 5.215 | 0.22 |
| 639.310 | 0.09 | 0.00 | 639.278 | 5.300 N | 0.000 E | 5.300 | 0.17 |
| 668.160 | 0.40 | 0.00 | 668.127 | 5.424 N | 0.000 E | 5.424 | 0.32 |
| 696.880 | 0.31 | 0.00 | 696.847 | 5.602 N | 0.000 E | 5.602 | 0.09 |
| 725.800 | 0.27 | 0.00 | 725.766 | 5.748 N | 0.000 E | 5.748 | 0.04 |
| 734.400 | 0.26 | 0.00 | 734.366 | 5.788 N | 0.000 E | 5.788 | 0.03 |
| 813.650 | 1.10 | 353.23 | 813.610 | 6.722 N | 0.090 W | 6.722 | 0.32 |
| 842.320 | 0.53 | 18.03 | 842.277 | 7.121 N | 0.081 W | 7.121 | 0.69 |
| 870.890 | 0.83 | 88.47 | 870.846 | 7.252 N | 0.167 E | 7.252 | 0.86 |
| 899.570 | 1.86 | 98.30 | 899.517 | 7.190 N | 0.835 E | 7.190 | 1.10 |
| 956.720 | 2.07 | 127.80 | 956.635 | 6.423 N | 2.569 E | 6.423 | 0.54 |
| 1014.200 | 2.43 | 162.77 | 1014.073 | 4.623 N | 3.750 E | 4.623 | 0.73 |
| 1100.390 | 3.68 | 204.01 | 1100.149 | 0.350 N | 3.165 E | 0.350 | 0.85 |
| 1129.190 | 4.46 | 205.68 | 1128.876 | 1.504 S | 2.304 E | -1.504 | 0.82 |
| 1158.130 | 4.53 | 204.02 | 1157.727 | 3.562 S | 1.351 E | -3.562 | 0.16 |
| 1187.370 | 4.39 | 203.45 | 1186.878 | 5.645 S | 0.435 E | -5.645 | 0.15 |
| 1216.000 | 4.44 | 203.57 | 1215.423 | 7.667 S | 0.445 W | -7.667 | 0.05 |
| 1244.280 | 4.48 | 206.57 | 1243.618 | 9.658 S | 1.377 W | -9.658 | 0.25 |
| 1284.200 | 4.61 | 205.06 | 1283.412 | 12.506 S | 2.754 W | -12.506 | 0.13 |
| 1300.980 | 4.65 | 203.38 | 1300.137 | 13.741 S | 3.309 W | -13.741 | 0.25 |
| 1329.900 | 4.59 | 205.24 | 1328.963 | 15.863 S | 4.267 W | -15.863 | 0.17 |
| 1416.800 | 4.27 | 202.81 | 1415.604 | 21.990 S | 7.004 W | -21.990 | 0.13 |
| 1445.220 | 4.21 | 202.25 | 1443.946 | 23.932 S | 7.810 W | -23.932 | 0.07 |
| 1472.150 | 4.21 | 200.09 | 1470.803 | 25.776 S | 8.524 W | -25.776 | 0.18 |
| 1530.610 | 4.18 | 198.76 | 1529.106 | 29.811 S | 9.948 W | -29.811 | 0.05 |
| 1588.180 | 4.19 | 198.08 | 1586.523 | 33.799 S | 11.275 W | -33.799 | 0.03 |
| 1616.980 | 4.15 | 199.72 | 1615.246 | 35.780 S | 11.953 W | -35.780 | 0.13 |
| 1645.860 | 4.17 | 198.78 | 1644.050 | 37.758 S | 12.644 W | -37.758 | 0.07 |
| 1674.590 | 4.18 | 197.38 | 1672.704 | 39.745 S | 13.293 W | -39.745 | 0.11 |
| 1732.100 | 4.45 | 198.68 | 1730.051 | 43.859 S | 14.634 W | -43.859 | 0.15 |
| 1760.800 | 4.46 | 201.16 | 1758.664 | 45.954 S | 15.393 W | -45.954 | 0.20 |
| 1805.200 | 4.28 | 201.27 | 1802.935 | 49.107 S | 16.617 W | -49.107 | 0.12 |
| 1825.000 | 4.28 | 201.27 | 1822.680 | 50.484 S | 17.153 W | -50.484 | 0.00 |

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT





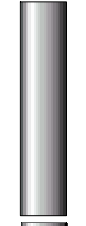



VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 0.00 DEGREES (GRID)
A TOTAL CORRECTION OF 12.01 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 1825.000 METRES
IS 53.319 METRES ALONG 198.77 DEGREES (GRID)

MWD RUN 200 - BHA

















MWD RUN 200 - MWD








| | Component Length (m) | | Sensor Measure Point Distance To Bit (m) |
|----------------|----------------------------|--------|---|
| HWDP | 138.060 | DM | 19.180 |
| Drill Collar | 27.810 | | |
| Cross Over Sub | 1.090 | HCIM | |
| Drilling Jars | 9.670 | | |
| Drill Collar | 88.330 | PWD | 15.170 |
| NMDC | 2.930 | | |
| MWD | 14.410 | EWR-P4 | |
| | | | 12.650 |

| | | | | | |
|---------------------------|---|-------|-----|---|--------|
| Cross Over Sub |  | 1.220 | |  | |
| Integral Blade Stabilizer |  | 2.490 | |  | |
| Pony collar |  | 3.040 | |  | |
| Integral Blade Stabilizer |  | 2.130 | | | |
| Tricone |  | .340 | | | |
| | | | DGR | | 10.310 |



MWD RUN 300 - BHA



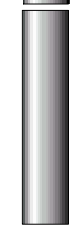


MWD RUN 300 - MWD

| | | Component Length (m) | | | Sensor Measure Point Distance To Bit (m) |
|----------------|---|----------------------|-------------------|---|--|
| HWDP |  | 138.060 | 8 DGWD 650 System |  | |
| Drill Collar |  | 27.810 | |  | |
| Cross Over Sub |  | 1.090 | DM |  | 19.220 |
| Drilling Jars |  | 9.670 | |  | |
| Drill Collar |  | 88.330 | HCIM |  | |
| NMDC |  | 2.930 | PWD |  | 15.210 |
| MWD |  | 14.410 | |  | |
| Cross Over Sub |  | 1.220 | EWR-P4 |  | 12.690 |

| | | | | | |
|---------------------------|---|-------|-----|---|--------|
| Integral Blade Stabilizer |  | 2.490 | DGR |  | 10.350 |
| Pony collar |  | 3.040 | |  | |
| Integral Blade Stabilizer |  | 2.130 | | | |
| PDC |  | .380 | |  | |

| | |
|-------------------|-------------------|
| MWD RUN 400 - BHA | MWD RUN 400 - MWD |
|-------------------|-------------------|

| | Component Length (m) | | Sensor Measure Point Distance To Bit (m) |
|----------------|----------------------|-------------------|---|
| HWDP | 138.060 | 8 DGWD 650 System |  |
| Drill Collar | 27.810 | | |
| Cross Over Sub | 1.090 | | |
| Drilling Jars | 9.670 | DM | 19.100 |
| Drill Collar | 88.330 | HCIM |  |
| NMDC | 2.930 | PWD | |
| MWD | 14.250 | EWR-P4 | |
| Cross Over Sub | 1.220 | | |
| | | | |

| | | | | | |
|---------------------------|---|-------|-----|---|--------|
| Integral Blade Stabilizer |  | 2.490 | DGR |  | 10.340 |
| Pony collar |  | 3.040 | | | |
| Integral Blade Stabilizer |  | 2.130 | | | |
| PDC |  | .380 | | | |