SHORE-BASED LOG PROCESSING

HOLE 1071G

Bottom felt: 101.5 mbrf (used for depth-shift to seafloor)
Total penetration: 424.2 mbsf

Logging Tools

The logs were recorded using the LWD (Logging-While-Drilling) technique. One advantage of this technique is that LWD can collect open-hole data in the uppermost part of the hole; this cannot be accomplished with wireline tools, as the drill pipe is usually kept in the upper part of the borehole. In addition, LWD measurements are made soon after the hole is cut, and before extensive hole deterioration occurs.

The LWD employed the following tool combinations:

CDR = Compensated Dual Resistivity (resistivity-gamma ray)
CDN = Compensated Density-Neutron (density-porosity-caliper)

Processing

Depth shift: Original logs have been depth-shifted to the seafloor (–101.5 m).

Gamma-ray data processing: Processing of the data is performed in real time on board ship by Schlumberger personnel. Gamma-ray data are measured as Natural Gamma Ray (GR) and Spectral Gamma Ray (NGT); for Leg 174A, the former has been corrected for hole size (bit size) and type of drilling fluid. Due to a problem in the acquisition software, the NGT total and computed gamma ray (SGR and CGR) could not be environmentally corrected and converted into API units. For this reason, they are not included in the database.

Neutron-porosity data processing: The neutron porosity measurements have been corrected for hole size (using differential caliper [DCAL]), temperature, mud salinity, and mud hydrogen index (mud pressure, temperature, and weight).

Density data processing: Density data have been processed to correct for the irregular borehole using a technique called "rotational processing," which is particularly useful in a deviated or enlarged borehole with irregular or elliptical shape. This statistical method measures the density variation while the tool rotates in the borehole, estimates the standoff (distance between the tool and the borehole wall), and corrects the density reading (a more detailed description of this technique is available upon request).

Resistivity data processing: A deconvolution technique called "qualitative resistivity overlay" aimed at providing enhanced vertical resolution is used for both shallow and deep resistivity measurements to compute output with 1-2-3-4-5 ft vertical resolution (documentation on this technique is also available upon request). The outputs are sampled at a 0.0762 m (3 in) sampling rate and are included in the database along with the standard 0.1524 m (0.5 ft) channels.

Quality Control

During the processing, quality control of the data is performed mainly by cross-correlation of all logging data. The best data are acquired in a circular borehole; this is particularly true for the density tool, which uses clamp-on stabilizers to reduce tool standoff and to ensure proper contact with the borehole wall. A data quality indicator is given by the DCAL channel, which estimates the tool standoff during the recording. Another quality indicator is represented by the density correction (DRHO).

Additional information about the logs can be found in the "Explanatory Notes" and "Site 1071" chapters of Volume 174A of the *Initial Reports*. For further questions about the logs, please contact:

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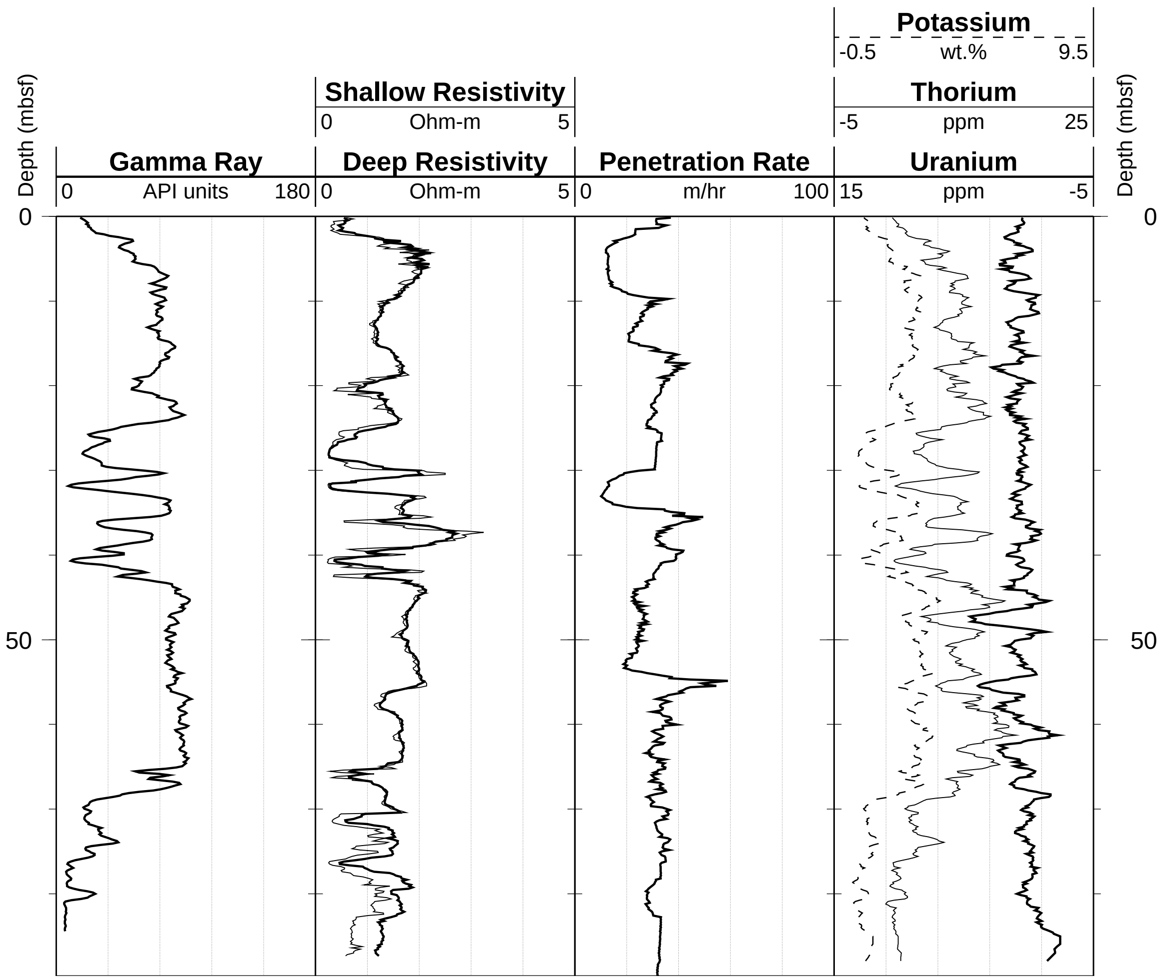
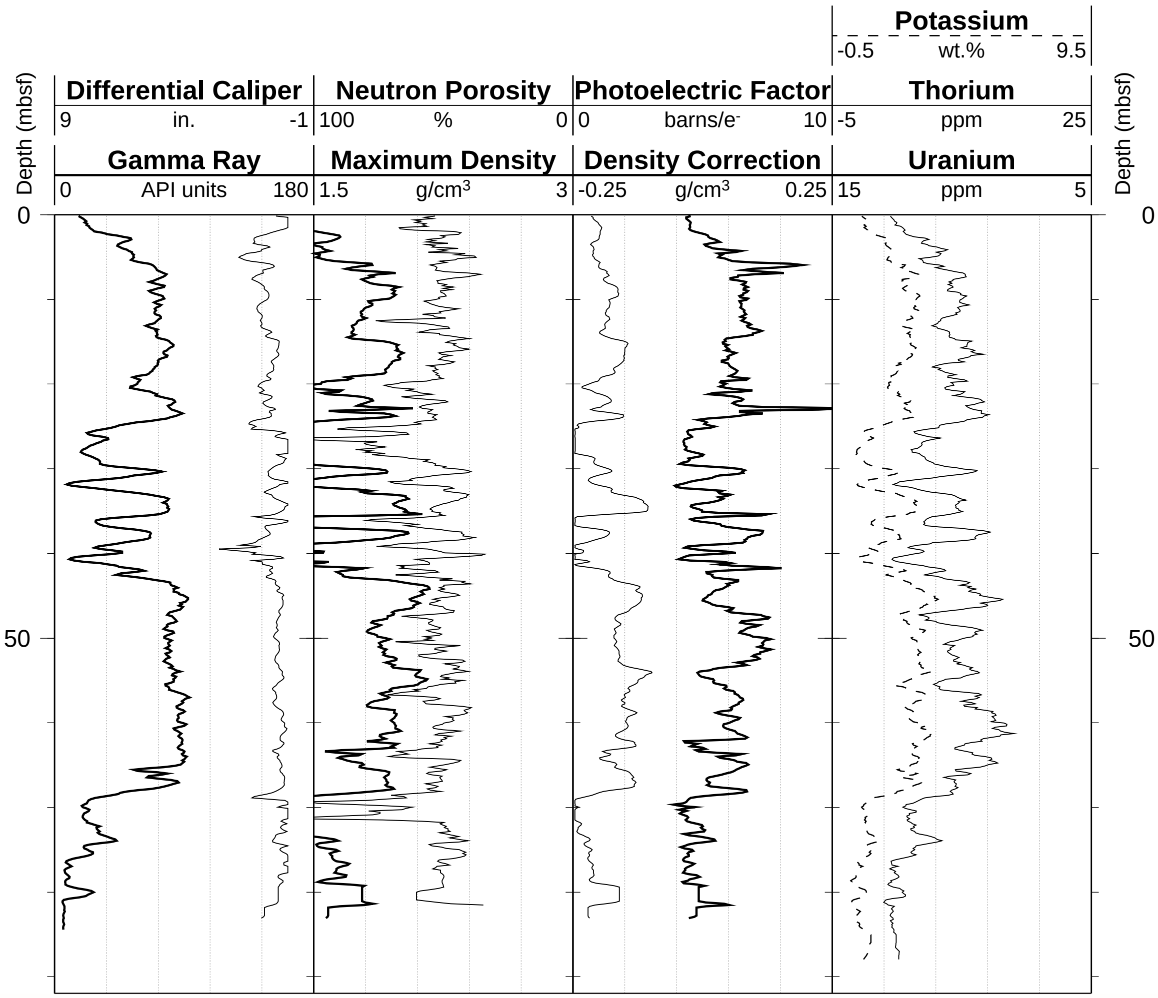
Hole 1071G: Natural Gamma Ray-Resistivity-Penetration Data



Hole 1071G: Natural Gamma Ray-Density-Porosity Logging Data



SHORE-BASED LOG PROCESSING

HOLE 1072A

Bottom felt: 109.5 mbrf (used for depth-shift to seafloor)
Total penetration: 306.8 mbsf
Total core recovered: 151.9 m (49.5%)

Logging Runs

Logging string 1: DIT-E/HLDT/APS/HNGS

The wireline heave compensator was not operational, due to electrical problems.

Bottom-Hole Assembly

The following bottom-hole assembly depth is as it appears on the logs after depth shift to the seafloor. As such, there might be a discrepancy with the original depth given by the drillers on board. Possible reasons for this discrepancy are ship heave and drill string and/or wireline stretch.

DIT-E/HLDT/APS/HNGS: Bottom-hole assembly at ~44.5 mbsf

Processing

Depth shift: No depth match was necessary, as only one logging run was recorded. The original logs have been depth-shifted to the seafloor (–110 m). The amount of depth shift corresponds to the water depth observed on the logs and differs by 0.5 m from the "bottom felt" depth given by the drillers.

Gamma-ray processing: HNGS data have been processed to correct for borehole size and type of drilling fluid.

High-resolution data: Neutron-porosity data were recorded at a sampling rate of 5.08 cm.

Quality Control

During the processing, quality control of the data is performed mainly by cross-correlation of all logging data. Large (>12 in) and/or irregular borehole affects most recordings, particularly those that require eccentralization (APS, HLDS) and good contact with the borehole wall. Hole 1072A was very enlarged in the lower portion as indicated by the caliper tool, which was completely open at 19 in. As no correction could compensate for such a large hole, HLDS and APS measurements in the lower section should be used with caution.

Data recorded through bottom-hole assembly should be used qualitatively only because of the attenuation on the incoming signal.

Hole diameter was recorded by the hydraulic caliper (LCAL) on the HLDS tool.

Additional information about the logs can be found in the "Explanatory Notes" and "Site 1072" chapters of Volume 174A of the *Initial Reports*. For further questions about the logs, please contact:

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Fax: 914-365-3182
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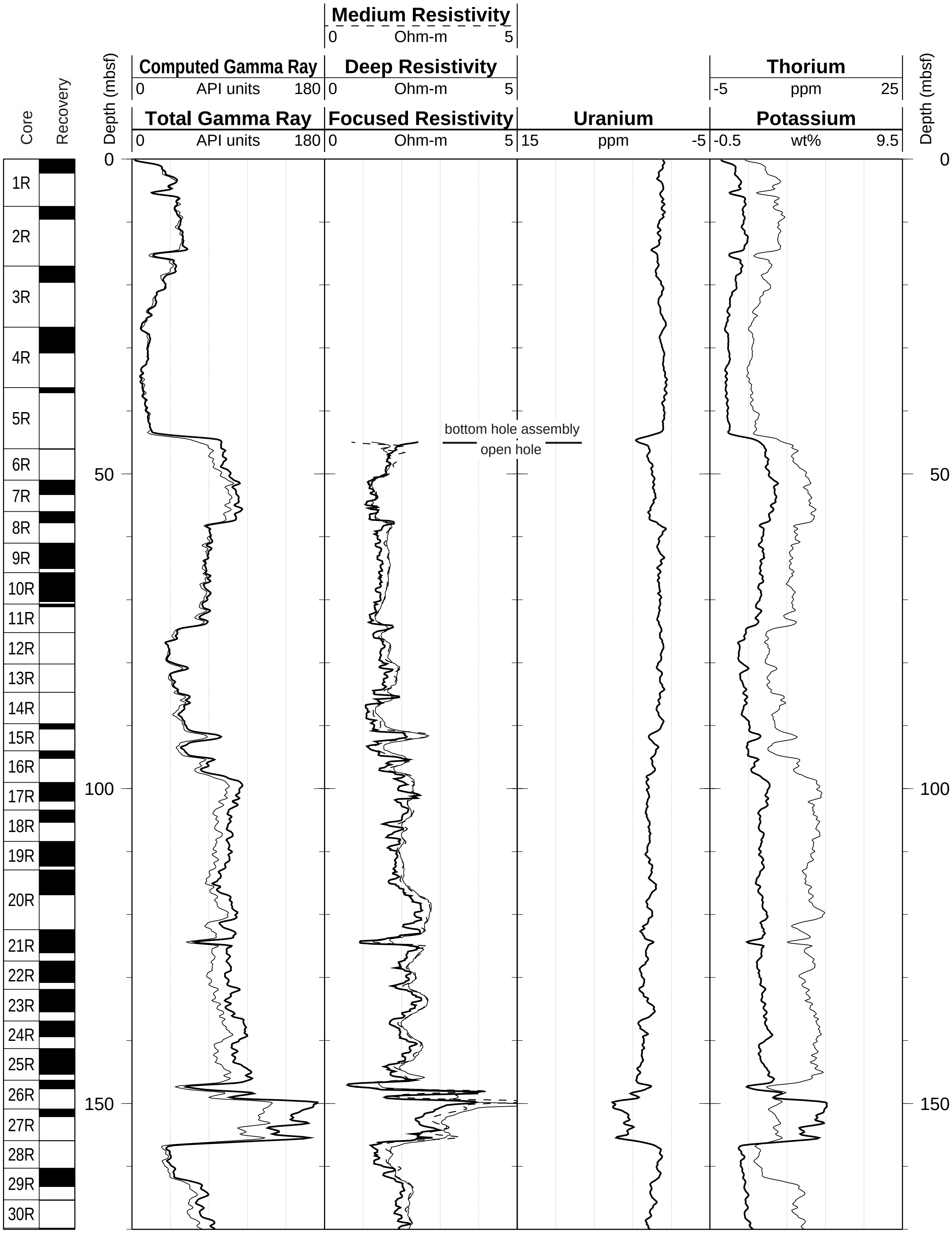
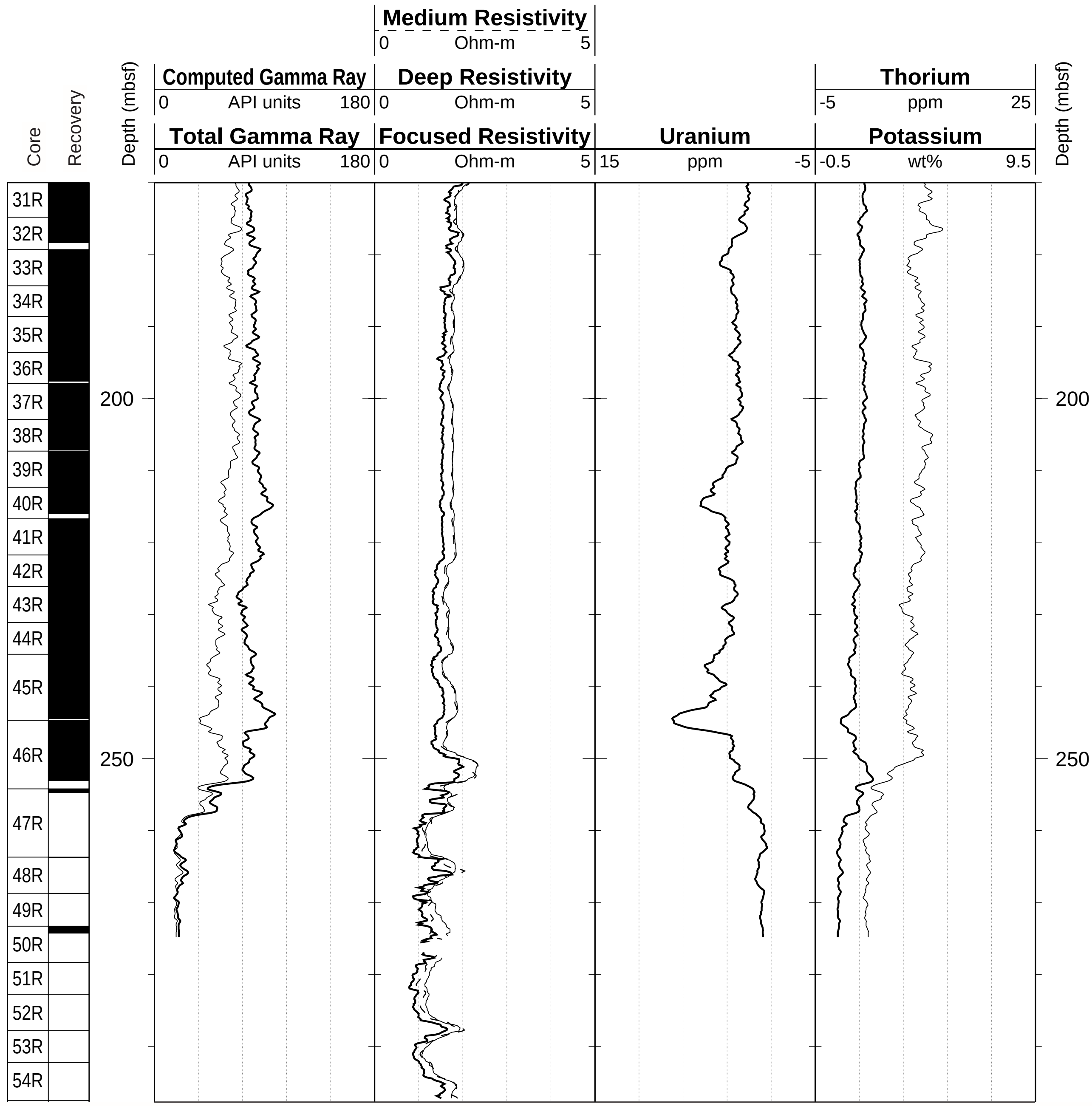
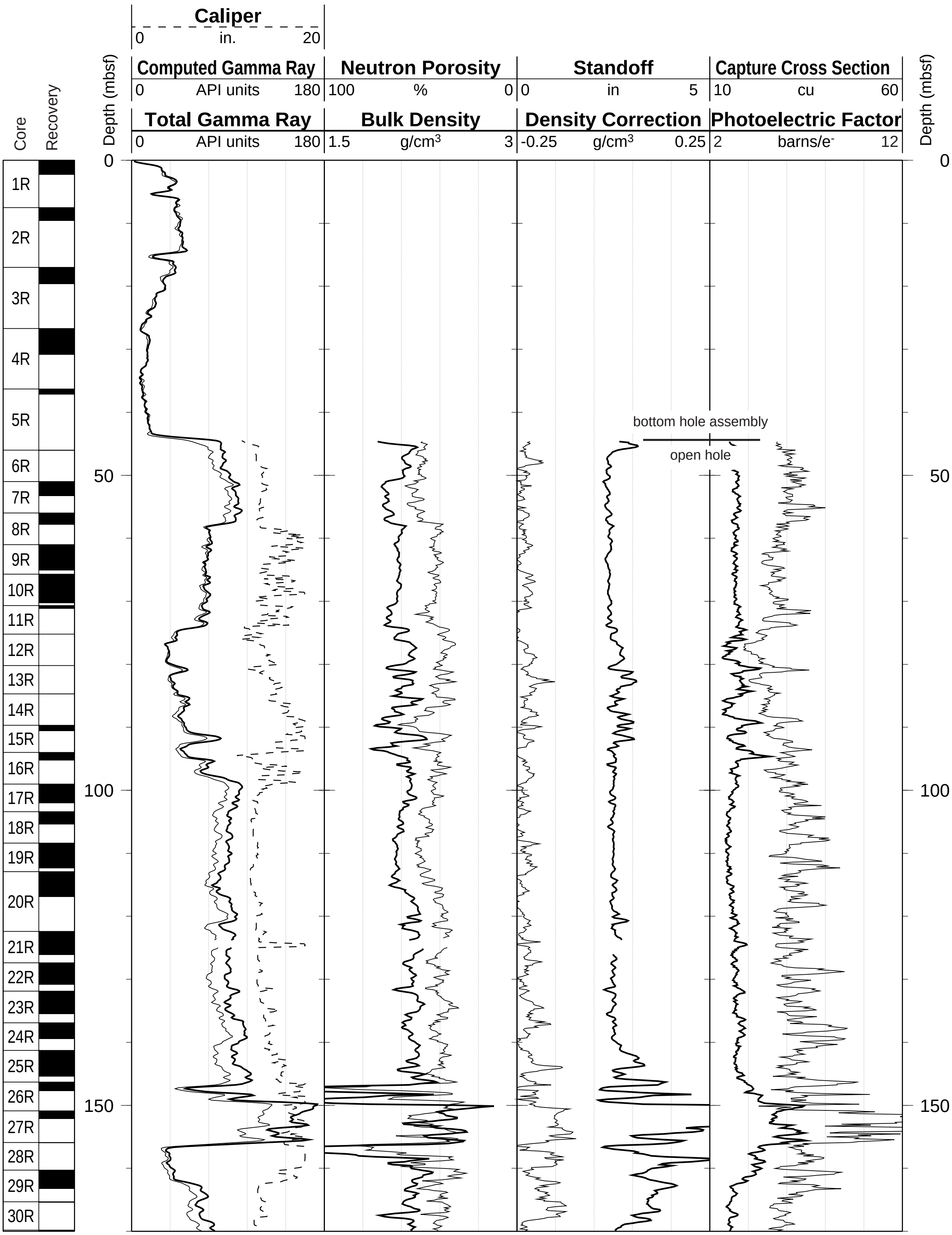
Hole 1072A: Natural Gamma Ray-Resistivity Logging Data



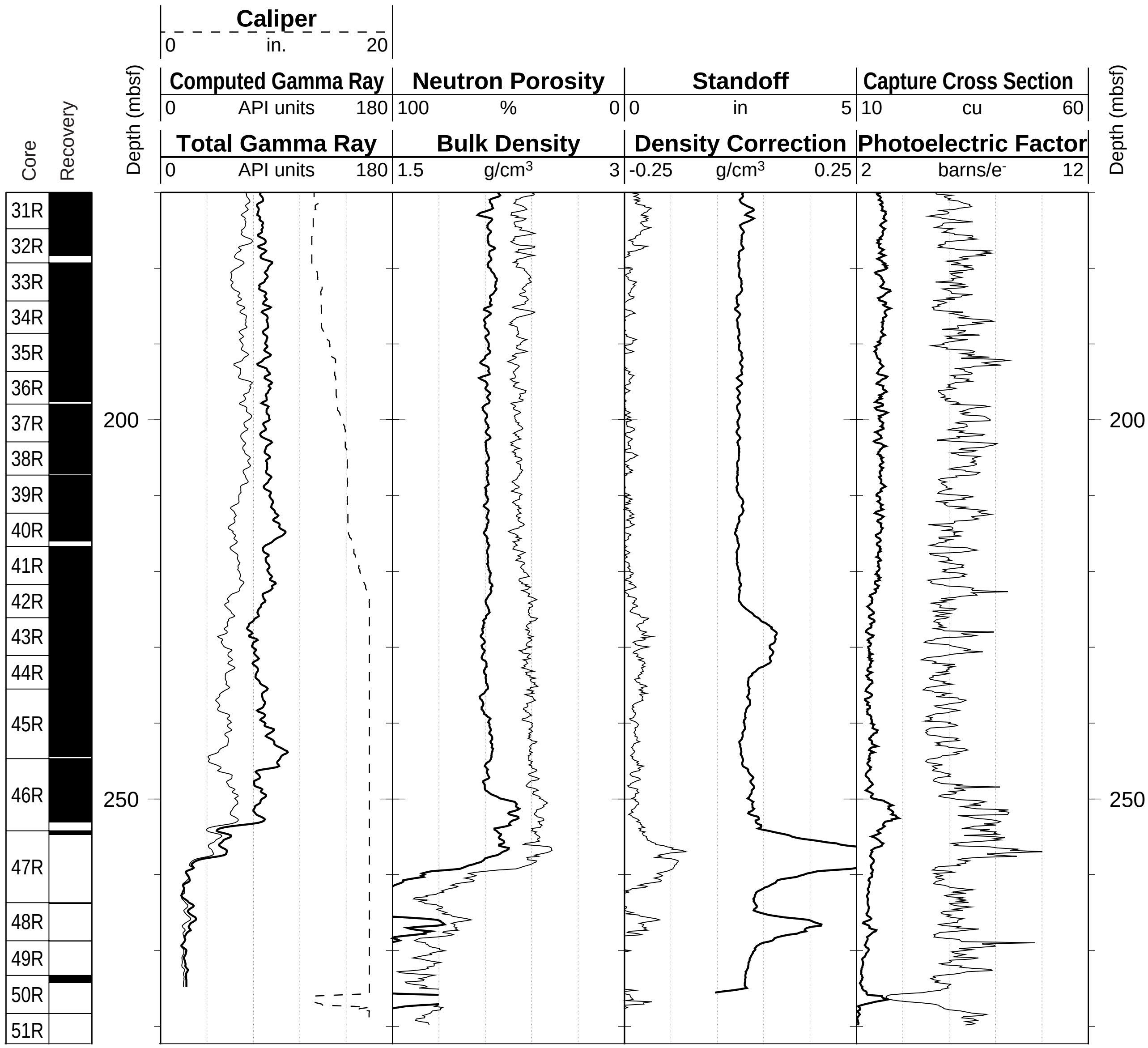
Hole 1072A: Natural Gamma Ray-Resistivity Logging Data (cont.)



Hole 1072A: Natural Gamma Ray-Density-Porosity Logging Data



Hole 1072A: Natural Gamma Ray-Density-Porosity Logging Data (cont.)



SHORE-BASED LOG PROCESSING

HOLE 1072B

Bottom felt: 109.5 mbrf (used for depth-shift to seafloor)
Total penetration: 358.6 mbsf
Total core recovered: none.

Logging Runs

Logging string 1: DIT-E/LSS/NGT
Logging string 2: FMS/GPIT/NGT

Wireline heave compensator was used to counter ship heave.

Bottom-Hole Assembly

The following bottom-hole assembly depths are as they appear on the logs after differential depth shift (see "Depth shift" section) and depth shift to the seafloor. As such, there might be a discrepancy from the original depths given by the drillers on board. Possible reasons for depth discrepancies are ship heave, use of wireline heave compensator, and drill string and/or wireline stretch.

DIT-E/LSS/NGT: Bottom-hole assembly at ~44 mbsf
FMS/GPIT/NGT: Bottom-hole assembly at ~44 mbsf

Processing

Depth shift: Original logs have been interactively depth-shifted with reference to the NGT from the FMS/GPIT/NGT run and to the seafloor (–109 m). The amount of depth shift corresponds to the water depth observed on the logs and differs 0.5 m from the "bottom felt" depth given by the drillers. The program used is an interactive, graphical depth-match program that allows the user to correlate logs visually and to define appropriate shifts. The reference and match channels are displayed on the screen, with vectors connecting old (reference curve) and new (match curve) shift depths. The total gamma-ray curve (SGR) from the NGT tool run on each logging string is used most often to correlate the logging runs. In general, the reference curve is chosen on the basis of constant, low cable tension and high cable speed (tools run at faster speeds are less likely to stick and are less susceptible to data degradation caused by ship heave). Other factors, however, such as the length of the logged interval, the presence of drill pipe, and the statistical quality of the collected data (better statistics are obtained at lower logging speeds) are also considered in the selection. A list of the amounts of differential depth shifts applied at this hole is available upon request.

Gamma-ray processing: NGT data have been processed to correct for borehole size and type of drilling fluid.

Acoustic data processing: The LSS logs have been processed to eliminate some of the noise and cycle skipping experienced during the recording. Using two sets of the four transit-time measurements and proper depth justification, four independent measurements over a 2 ft interval centered on the depth of interest are determined, each based on the difference between a pair of transmitters and receivers. The program discards any transit time that is negative or falls outside a range of meaningful values selected by the processor.

Quality Control

Null value = –999.25. This value may replace recorded log values or results that are considered invalid (e.g., processed sonic data).

During the processing, quality control of the data is mainly performed by cross-correlation of all logging data. The quality of the data recorded in Hole 1072B is generally good.

Data recorded through bottom-hole assembly, such as the NGT data above 44 mbsf, should be used qualitatively only because of the attenuation of the incoming signal.

Hole diameter was recorded by the calipers on the FMS string (C1 and C2).

Additional information about the logs can be found in the "Explanatory Notes" and "Site 1072" chapters of Volume 174A of the *Initial Reports*. For further questions about the logs, please contact:

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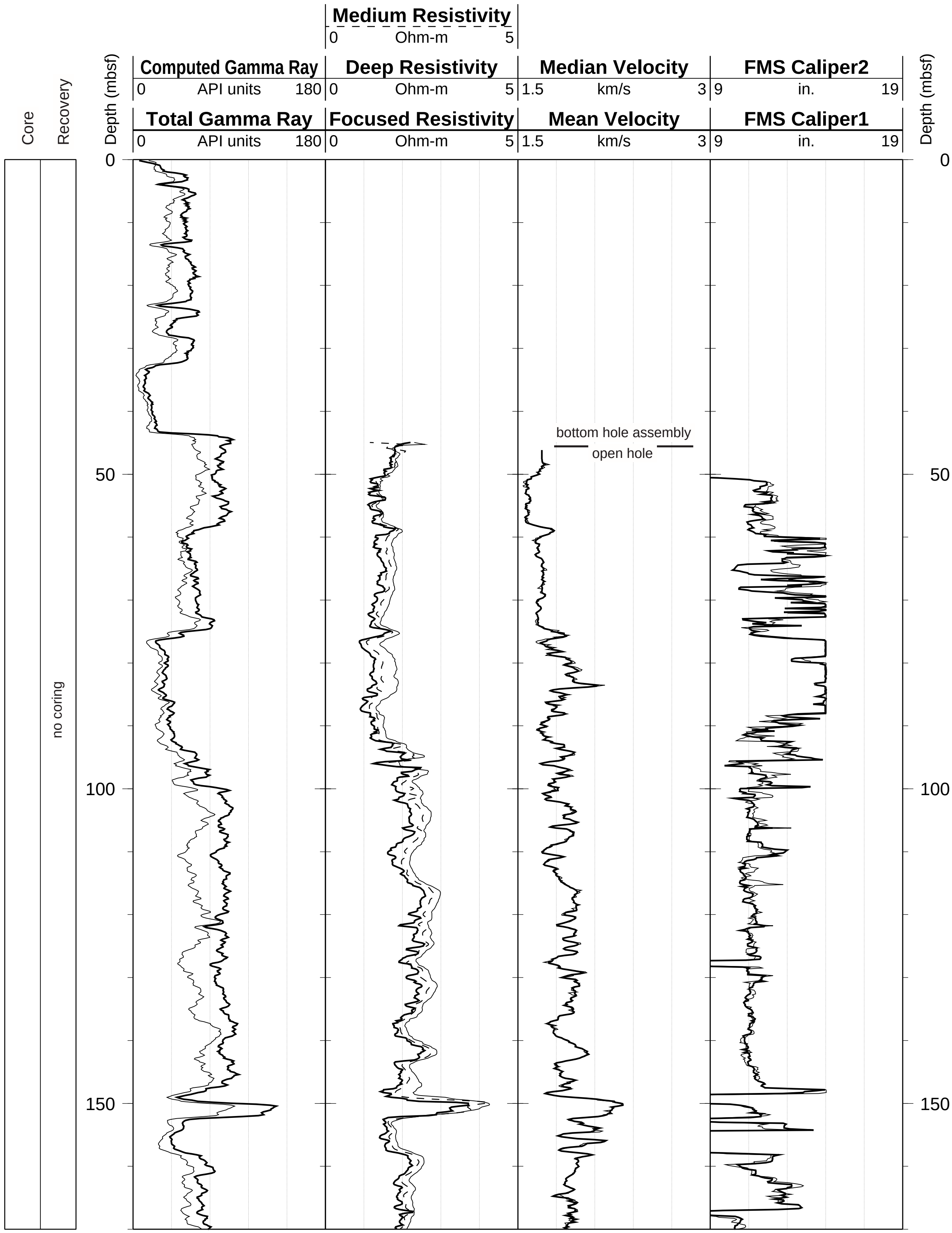
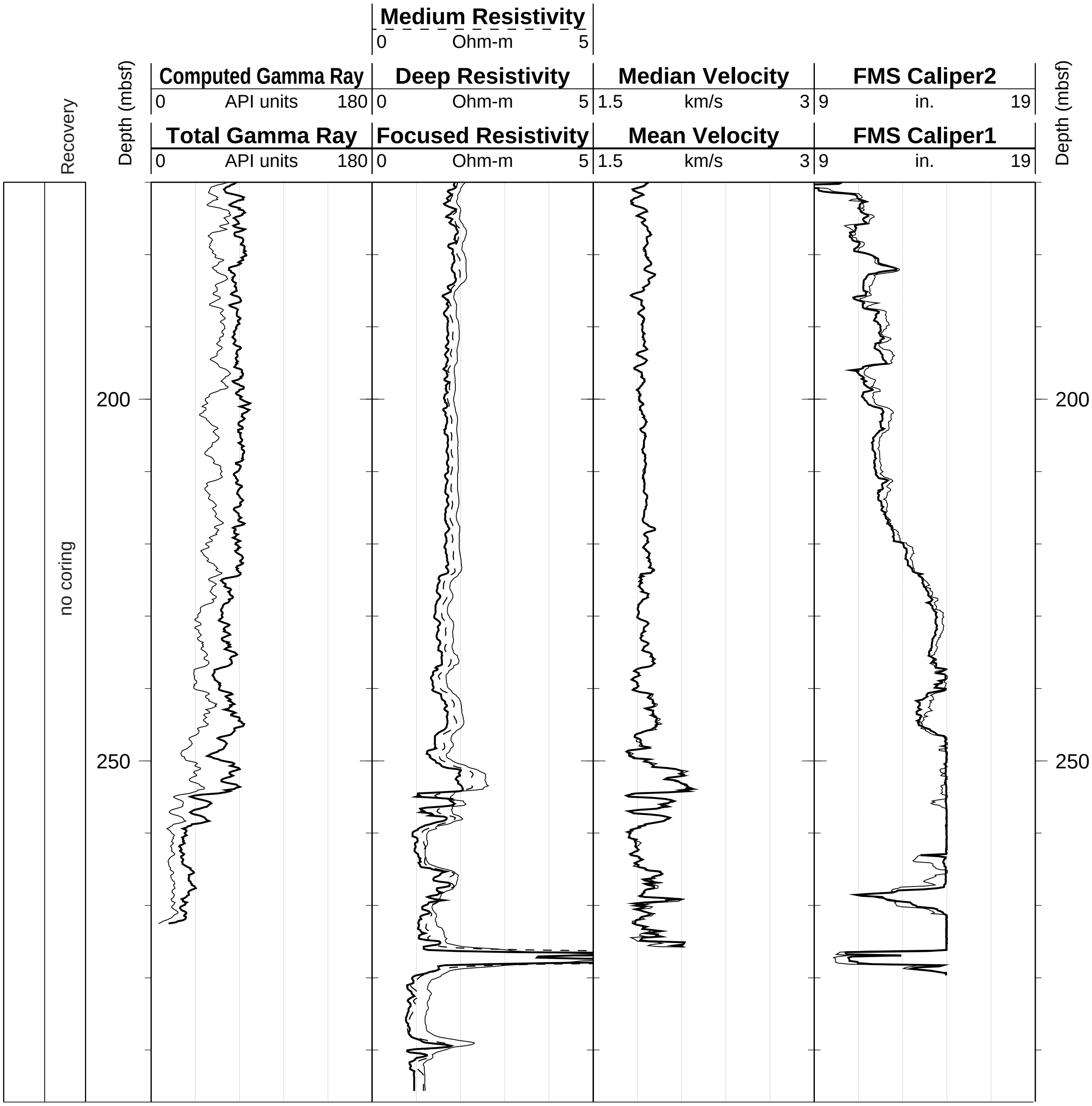
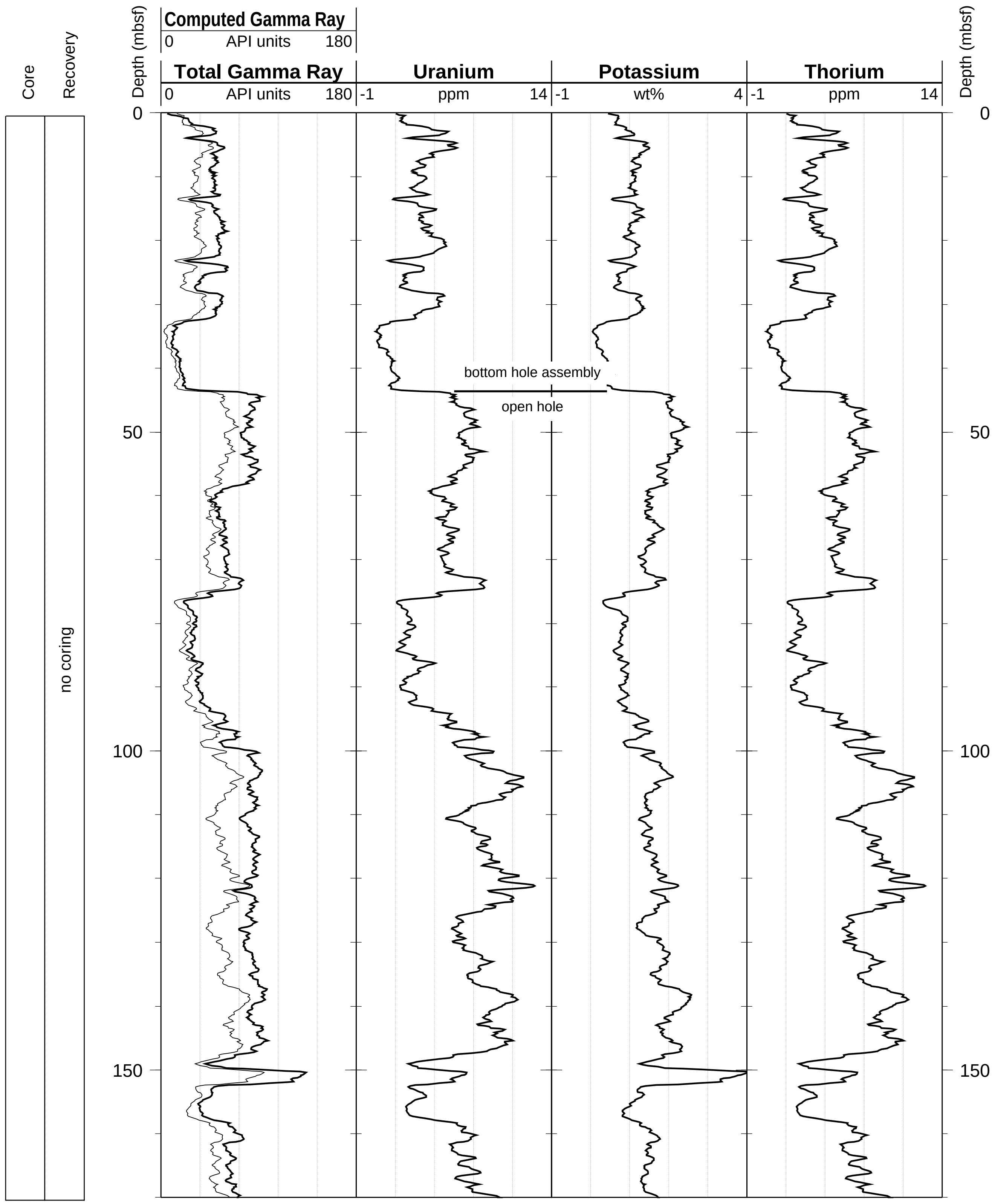
Hole 1072B: Natural Gamma Ray-Resistivity-Sonic Logging Data



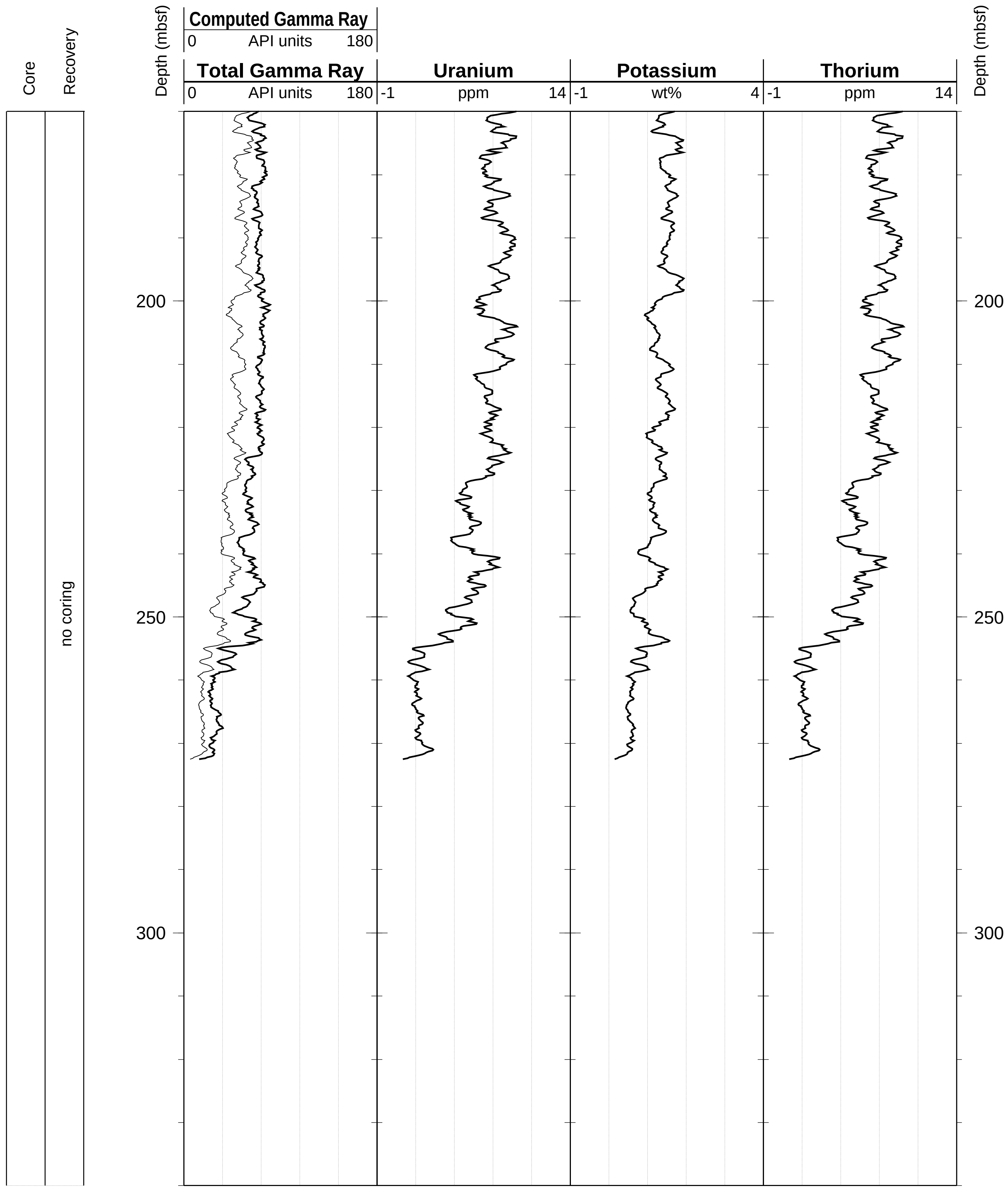
Hole 1072B: Natural Gamma Ray-Resistivity-Sonic Logging Data (cont.)



Hole 1072B: Natural Gamma Ray Logging Data



Hole 1072B: Natural Gamma Ray Logging Data (cont.)



SHORE-BASED LOG PROCESSING

HOLE 1072C

Bottom felt: 111 mbrf (used for depth-shift to seafloor)
Total penetration: 218 mbsf

Logging Tools

The logs were recorded using the LWD (Logging-While-Drilling) technique. One advantage of this technique is that LWD can collect open-hole data in the uppermost part of the hole; this cannot be accomplished with wireline tools, as the drill pipe is usually kept in the upper part of the borehole. In addition, LWD measurements are made soon after the hole is cut, before extensive hole deterioration occurs.

The LWD employed the following tool combinations:

CDR = Compensated Dual Resistivity (resistivity-gamma ray)
CDN = Compensated Density-Neutron (density-porosity-caliper)

Processing

Depth shift: Original logs have been depth-shifted to the seafloor (–110 m). This amount differs 1 m from the "bottom felt" depth given by the drillers.

Gamma-ray data processing: Processing of the data is performed in real time on board ship by Schlumberger personnel. Gamma-ray data are measured as Natural Gamma Ray (GR) and Spectral Gamma Ray (NGT); for Leg 174A, the former has been corrected for hole size (bit size) and type of drilling fluid. Due to a problem in the acquisition software, the NGT total and computed gamma ray (SGR and CGR) could not be environmentally corrected and converted into API units. For this reason, they are not included in the database.

Neutron-porosity data processing: The neutron porosity measurements have been corrected for hole size (using differential caliper [DCAL]), temperature, mud salinity, and mud hydrogen index (mud pressure, temperature, and weight).

Density data processing: Density data have been processed to correct for the irregular borehole using a technique called "rotational processing," which is particularly useful in a deviated or enlarged borehole with irregular or elliptical shape. This statistical method measures the density variation while the tool rotates in the borehole, estimates the standoff (distance between the tool and the borehole wall), and corrects the density reading (a more detailed description of this technique is available upon request).

Resistivity data processing: A deconvolution technique called "qualitative resistivity overlay" aimed at providing enhanced vertical resolution is used for both shallow and deep resistivity measurements to compute output with 1-2-3-4-5 ft vertical resolution (documentation on this technique is also available upon request). The outputs are sampled at a 0.0762 m (3 in) sampling rate and are included in the database along with the standard 0.1524 m (0.5 ft) channels.

Quality Control

During the processing, quality control of the data is performed mainly by cross-correlation of all logging data. The best data are acquired in a circular borehole; this is particularly true for the density tool, which uses clamp-on stabilizers to reduce tool standoff and to ensure proper contact with the borehole wall. A data quality indicator is given by the DCAL channel, which estimates the tool standoff during the recording. Another quality indicator is represented by the density correction (DRHO).

Additional information about the logs can be found in the "Explanatory Notes" and "Site 1072" chapters of Volume 174A of the *Initial Reports*. For further questions about the logs, please contact:

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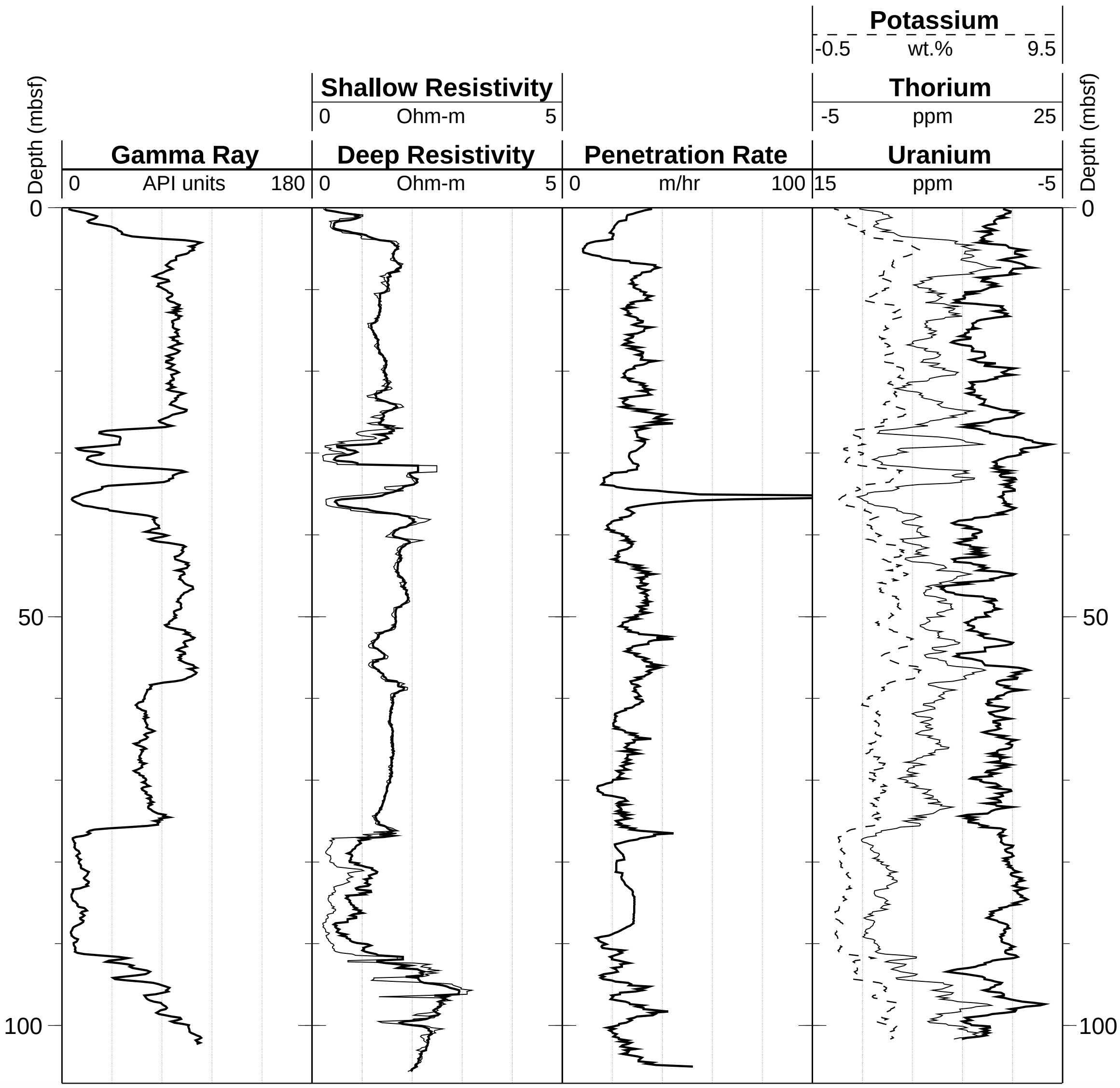
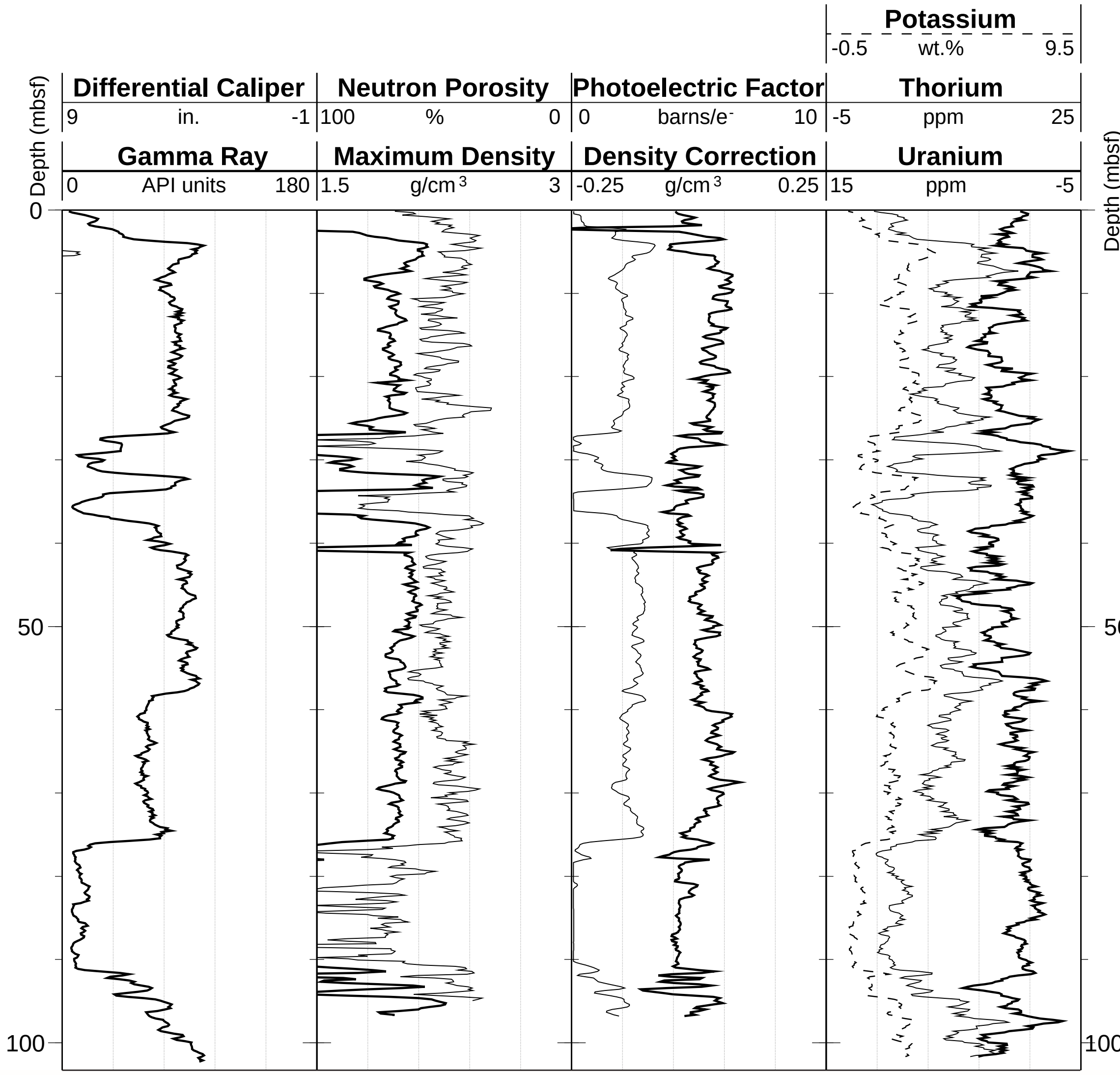
Hole 1072C: Natural Gamma Ray-Resistivity-Penetration Logging Data



Hole 1072C: Natural Gamma Ray-Density-Porosity Logging Data



SHORE-BASED LOG PROCESSING

HOLE 1072D

Bottom felt: 111 mbrf (used for depth-shift to seafloor)
Total penetration: 355.9 mbsf

Logging Tools

The logs were recorded using the LWD (Logging-While-Drilling) technique. One advantage of this technique is that LWD can collect open-hole data in the uppermost part of the hole; this cannot be accomplished with wireline tools, as the drill pipe is usually kept in the upper part of the borehole. In addition, LWD measurements are made soon after the hole is cut, and before extensive hole deterioration occurs.

The LWD employs the following tool combinations:

CDR = Compensated Dual Resistivity (resistivity-gamma ray)
CDN = Compensated Density-Neutron (density-porosity-caliper)

Processing

Depth shift: Original logs have been depth-shifted to the seafloor (–110 m). This amount differs 1 m from the "bottom felt" depth given by the drillers.

Gamma-ray data processing: Processing of the data is performed in real time on board ship by Schlumberger personnel. Gamma-ray data are measured as Natural Gamma Ray (GR) and Spectral Gamma Ray (NGT); for Leg 174A, the former has been corrected for hole size (bit size) and type of drilling fluid. Due to a problem in the acquisition software, the NGT total and computed gamma ray (SGR and CGR) could not be environmentally corrected and converted into API units. For this reason, they are not included in the database.

Neutron-porosity data processing: The neutron porosity measurements have been corrected for hole size (using differential caliper [DCAL]), temperature, mud salinity, and mud hydrogen index (mud pressure, temperature, and weight).

Density data processing: Density data have been processed to correct for the irregular borehole using a technique called "rotational processing," which is particularly useful in a deviated or enlarged borehole with irregular or elliptical shape. This statistical method measures the density variation while the tool rotates in the borehole, estimates the standoff (distance between the tool and the borehole wall), and corrects the density reading (a more detailed description of this technique is available upon request).

Resistivity data processing: A deconvolution technique called "qualitative resistivity overlay" aimed at providing enhanced vertical resolution is used for both shallow and deep resistivity measurements to compute output with 1-2-3-4-5 ft vertical resolution (documentation on this technique is also available upon request). The outputs are sampled at a 0.0762 m (3 in) sampling rate and are included in the database along with the standard 0.1524 m (0.5 ft) channels.

Quality Control

During the processing, quality control of the data is performed mainly by cross-correlation of all logging data. The best data are acquired in a circular borehole; this is particularly true for the density tool, which uses clamp-on stabilizers to reduce tool standoff and to ensure proper contact with the borehole wall. A data quality indicator is given by the DCAL channel, which is an estimate of the tool standoff during the recording. Another quality indicator is represented by the density correction (DRHO).

Additional information about the logs can be found in the "Explanatory Notes" and "Site 1072" chapters of Volume 174A of the *Initial Reports*. For further questions about the logs, please contact:

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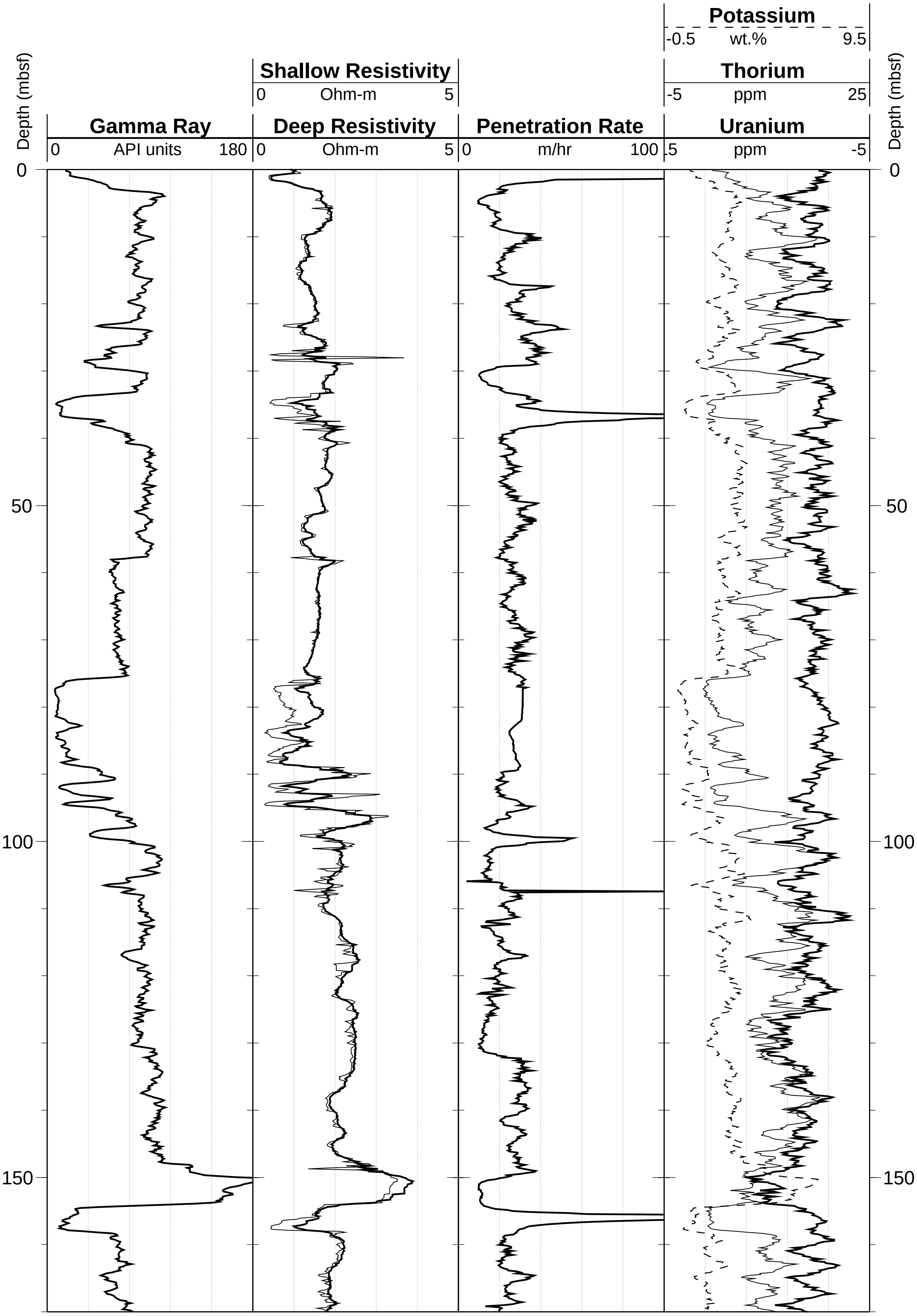
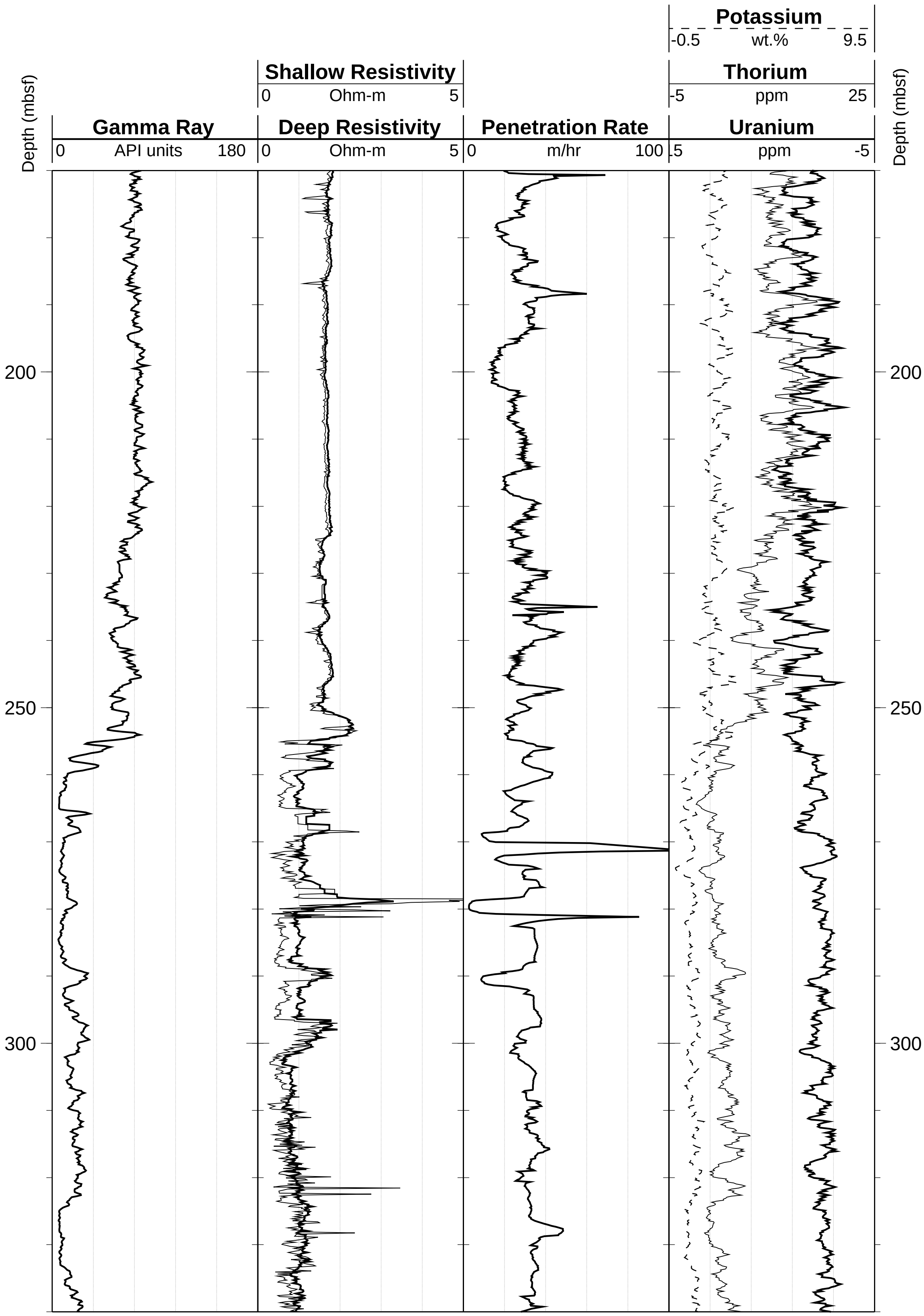
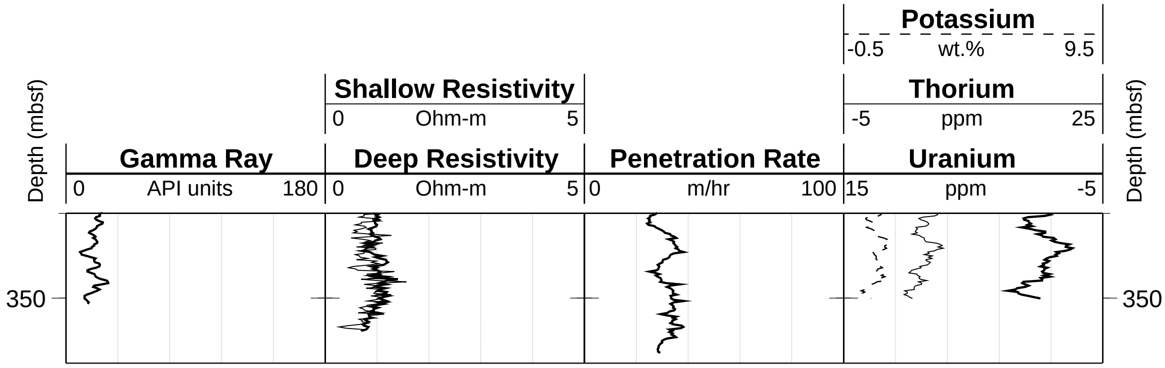
Hole 1072D: Natural Gamma Ray-Resistivity-Penetration Logging Data



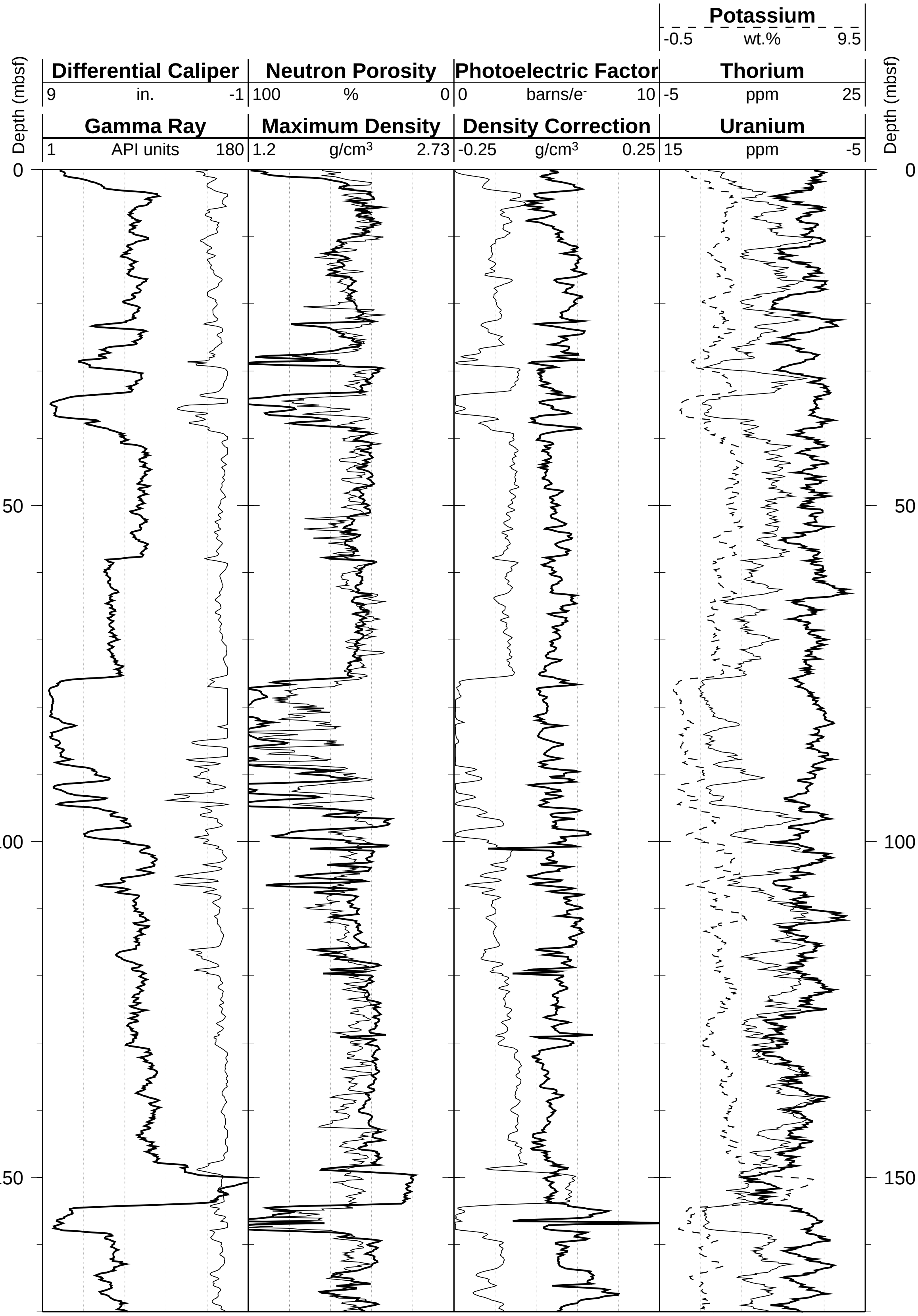
Hole 1072D: Natural Gamma Ray-Resistivity-Penetration Logging Data (cont.)



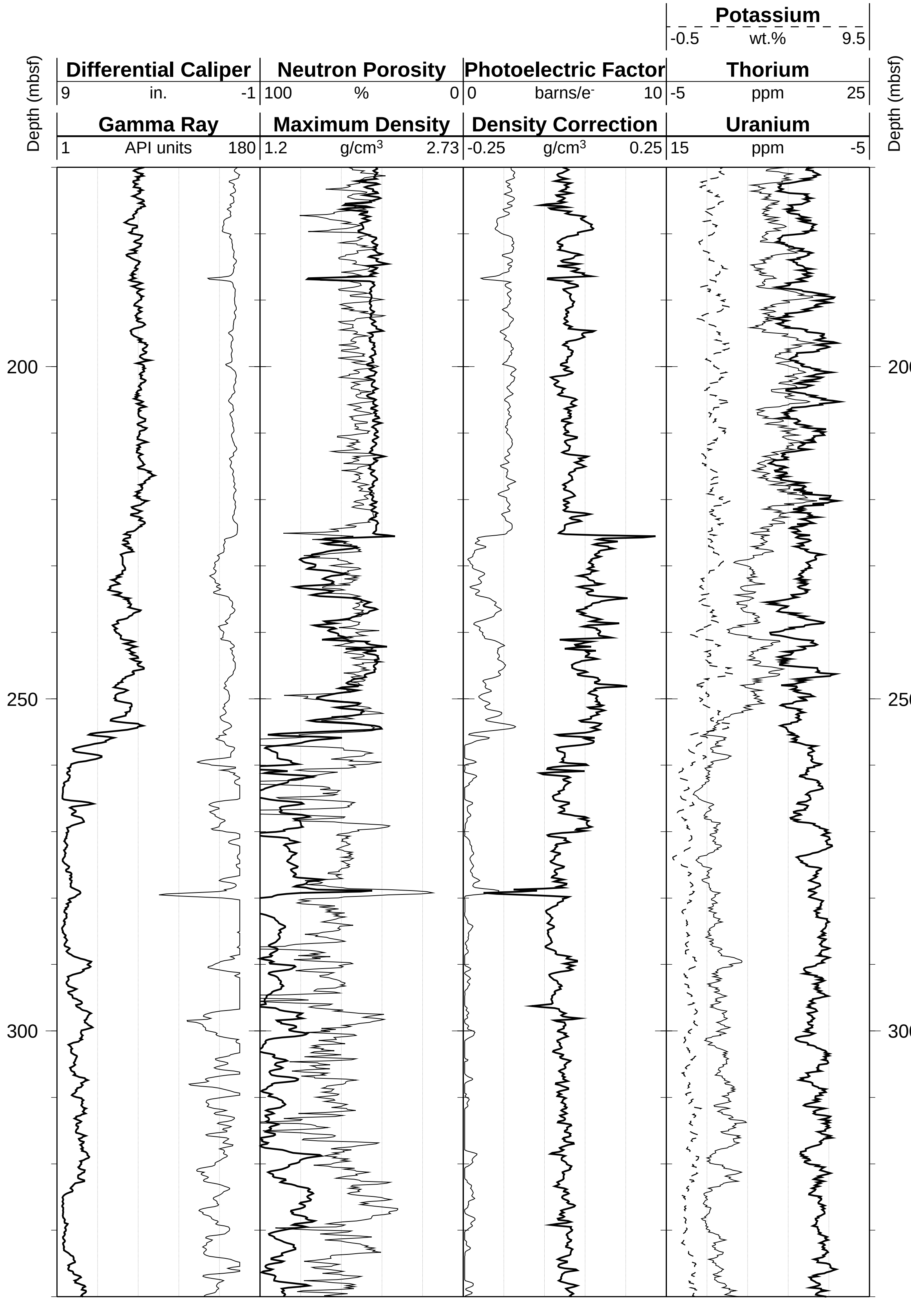
Hole 1072D: Natural Gamma Ray-Resistivity-Penetration Logging Data (cont.)



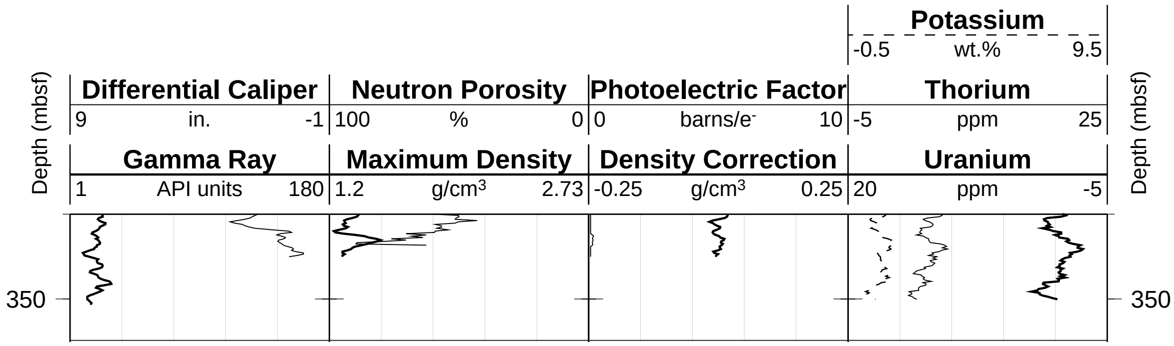
Hole 1072D: Natural Gamma Ray-Density-Porosity Logging Data



Hole 1072D: Natural Gamma Ray-Density-Porosity Logging Data (cont.)



Hole 1072D: Natural Gamma Ray-Density-Porosity Logging Data (cont.)



SHORE-BASED LOG PROCESSING

HOLE 1073A

Bottom felt: 650.9 mbrf (used for depth-shift to seafloor)
Total penetration: 663.6 mbsf
Total core recovered: 663 m (99.9%)

Logging Runs

Logging string 1: DIT-E/LSS/NGT (upper, middle, and lower sections)
Logging string 2: DIT-E/HLDT/APS/HNGS (lower section)

Wireline heave compensator was used to counter ship heave in all runs.

Bottom-Hole Assembly/Pipe

The following bottom-hole assembly and pipe depths are as they appear on the logs after differential depth shift (see "Depth shift" below) and depth shift to the seafloor. As such, there might be a discrepancy with the original depths given by the drillers onboard. Possible reasons for depth discrepancies are ship heave, use of wireline heave compensator, and drill string and/or wireline stretch.

DIT-E/LSS/NGT: Bottom-hole assembly at ~85 mbsf (upper section)
DIT-E/LSS/NGT: Drill pipe at ~25 mbsf (upper section)
DIT-E/LSS/NGT: Bottom-hole assembly at ~245 mbsf (middle section)
DIT-E/LSS/NGT: Bottom-hole assembly at ~343 mbsf (lower section)
DIT-E/LSS/NGT: Drill pipe at ~283 mbsf (lower section)
DIT-E/HLDT/APS/HNGS: Bottom-hole assembly at ~358 mbsf

Processing

Depth shift: Original logs have been interactively depth-shifted with reference to NGT from DIT-E/LSS/NGT run and to the seafloor (–650 m). In particular, the lower section of the DIT-E/LSS/NGT has been shifted with reference to the upper section, whereas the middle section of the DIT-E/LSS/NGT and the lower section of the DIT-E/HLDT/APS/HNGS have been matched to the shifted NGT from the lower section. The program used is an interactive, graphical depth-match program that allows the user to correlate logs visually and to define appropriate shifts. The reference and match channels are displayed on the screen, with vectors connecting old (reference curve) and new (match curve) shift depths. The total gamma-ray curve (SGR or HSGR) from the NGT or HNGS tool run on each logging string is used most often to correlate the logging runs. In general, the reference curve is chosen on the basis of constant, low cable tension and high cable speed (tools run at faster speeds are less likely to stick and are less susceptible to data degradation caused by ship heave). Other factors, however, such as the length of the logged interval, the presence of drill pipe, and the statistical quality of the collected data (better statistics are obtained at lower logging speeds) are also considered in the selection. A list of the amounts of differential depth shifts applied at this hole is available upon request.

Gamma-ray processing: NGT and HNGS data have been processed to correct for borehole size and type of drilling fluid.

Acoustic data processing: The long-spacing (8-10-10-12 ft) sonic data recorded in three sections are of excellent quality; they have been processed to eliminate some of the minor cycle skips experienced during the recording. Using two sets of the four transit-time measurements and proper depth justification, four independent measurements over a 2-ft interval centered on the depth of interest are determined, each based on the difference between a pair of transmitters and receivers. The program discards any transit time that is negative or falls outside a range of meaningful values selected by the processor. The data from the three sections have been merged as follows:

upper section: 87.5–250 mbsf
middle section: 250–350 mbsf
lower section: 350–639 mbsf

High-resolution data: Neutron-porosity data were recorded at a sampling rate of 5.08 cm.

Quality Control

Null value = –999.25. This value may replace recorded log values or results that are considered invalid (e.g., processed sonic data).

During the processing, quality control of the data is mainly performed by cross-correlation of all logging data. Large (>12 in) and/or irregular boreholes affect most recordings, particularly those that require eccentralization (APS, HLDT) and good contact with the borehole wall. The data are generally of very good quality, with the exception of the APS/HLDT data over those intervals where the hole is very enlarged (for example, in the 419–443 and 457–465 mbsf intervals).

Data recorded through the bottom-hole assembly should be used qualitatively only because of the attenuation of the incoming signal. Invalid gamma-ray data were recorded at 78–81 mbsf.

Hole diameter was recorded by the hydraulic caliper (LCAL) on the HLDT tool.

Additional information about the logs can be found in the "Explanatory Notes" and "Site 1073" chapters of Volume 174A of the *Initial Reports*. For further questions about the logs, please contact:

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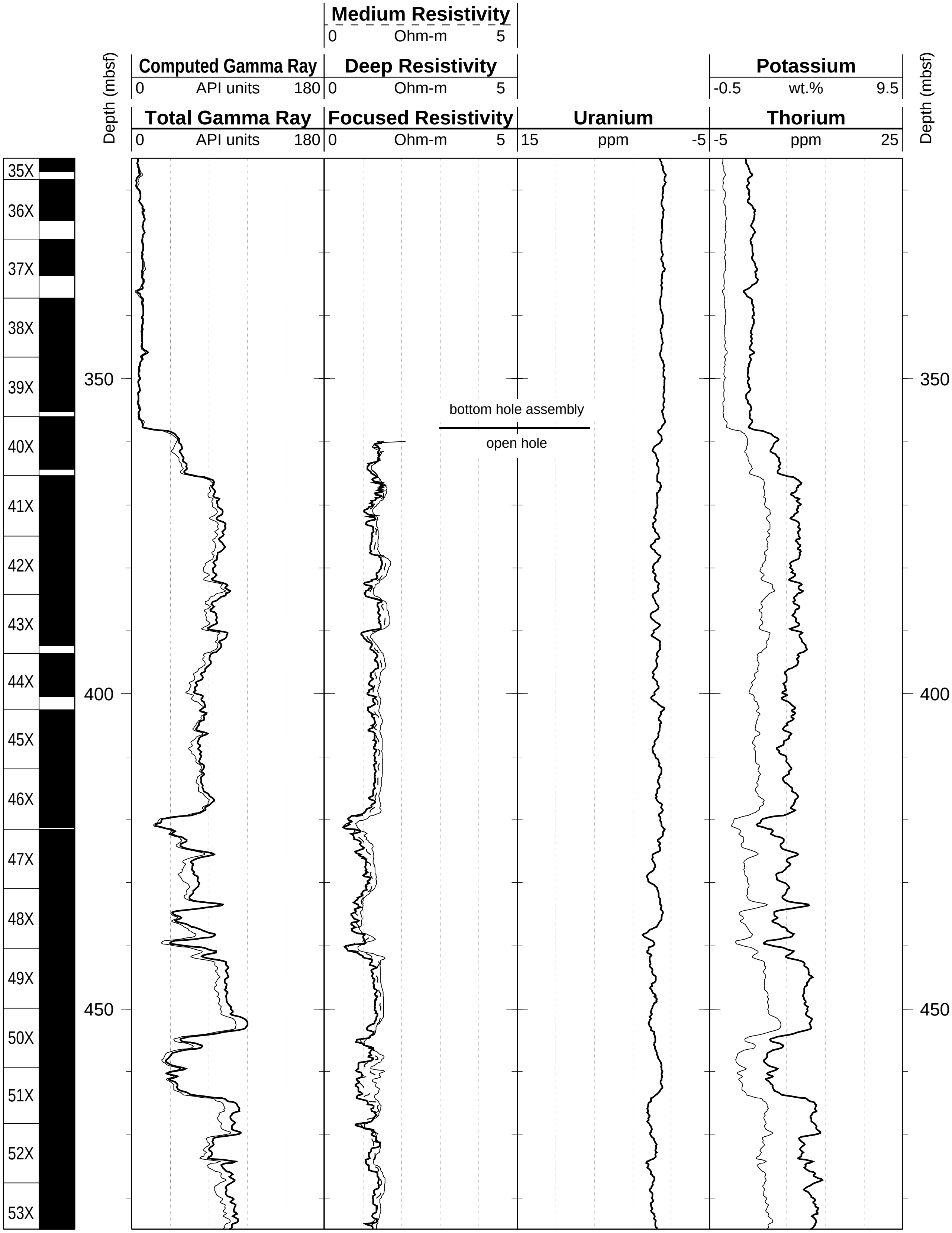
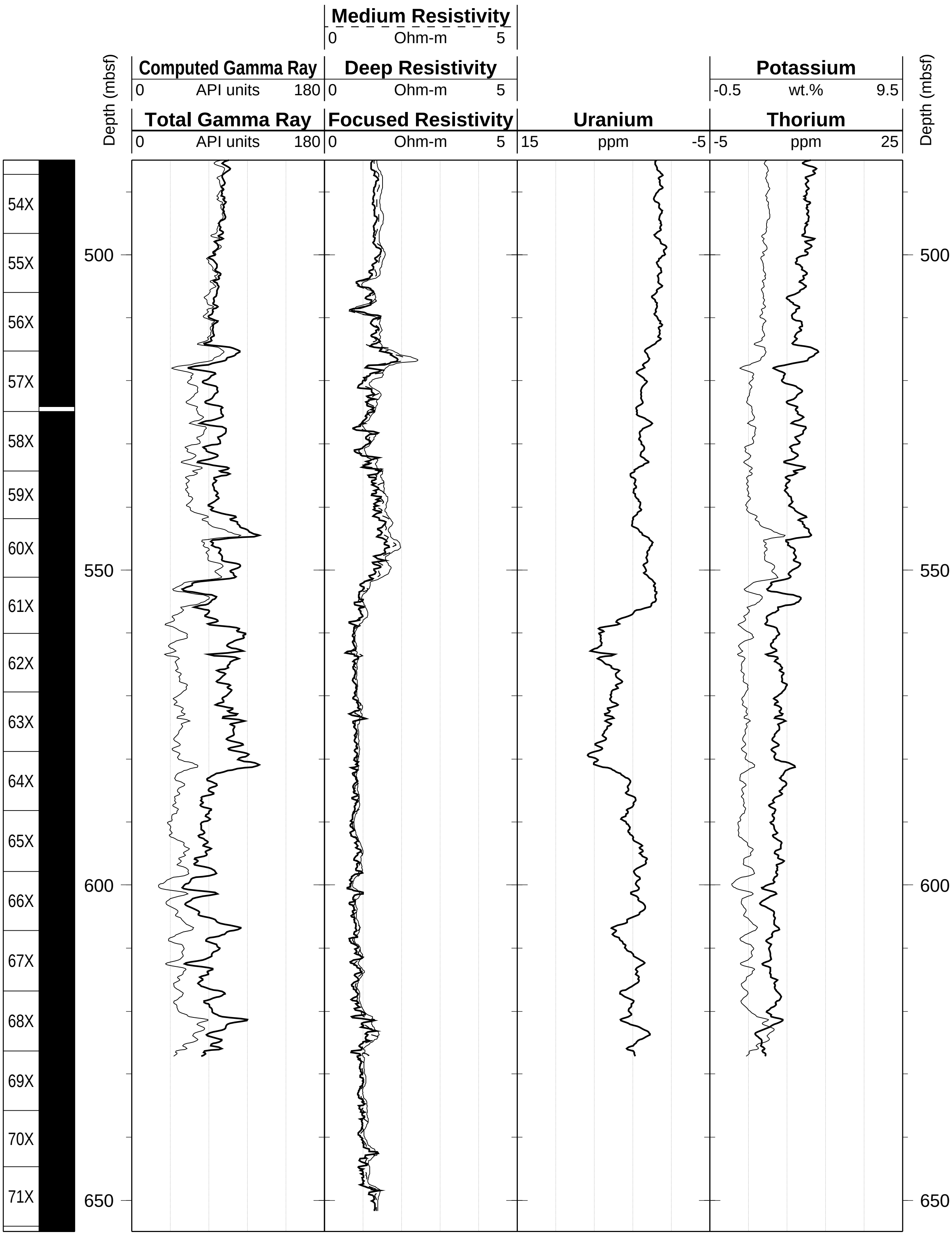
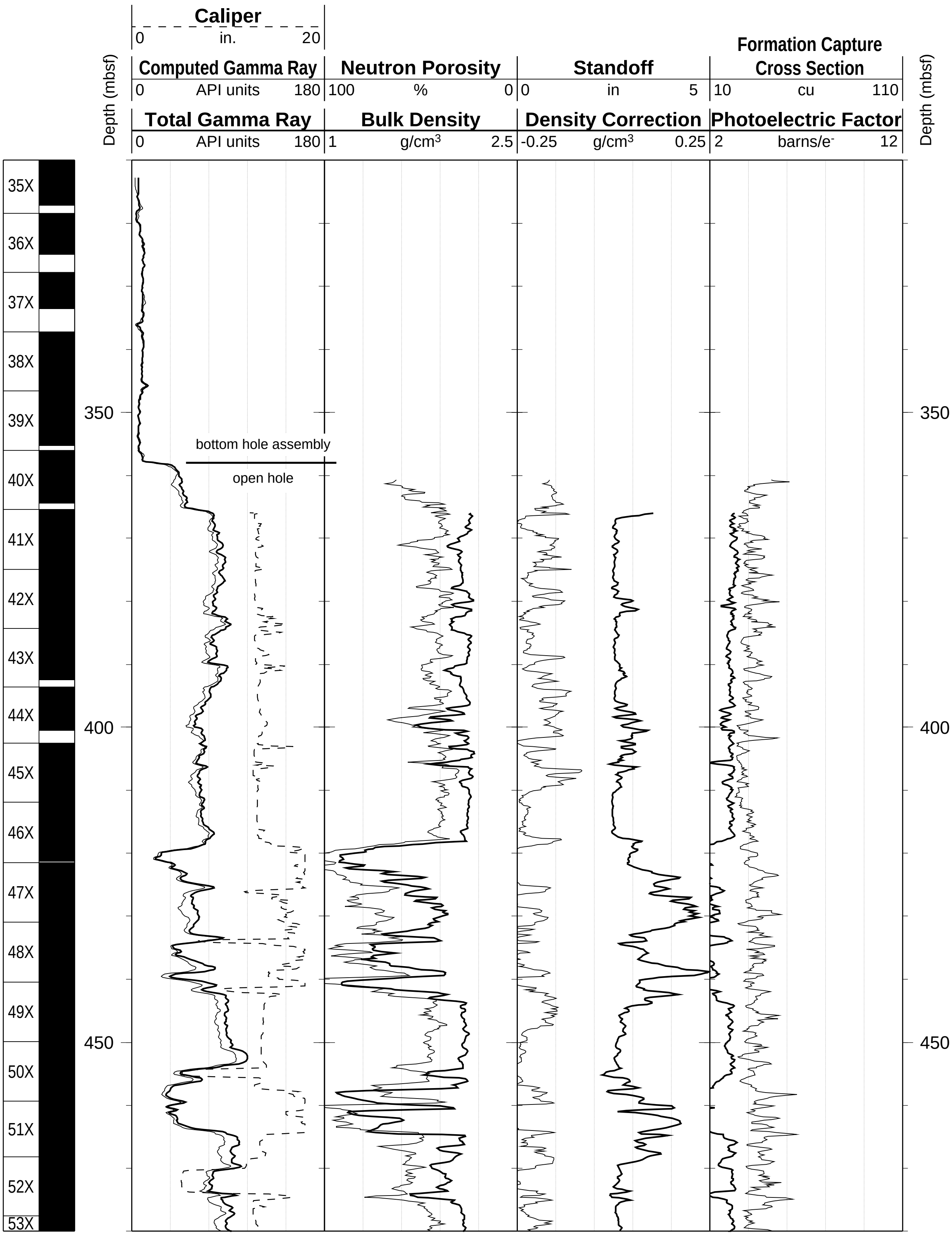
Hole 1073A: Natural Gamma Ray-Resistivity Logging Data



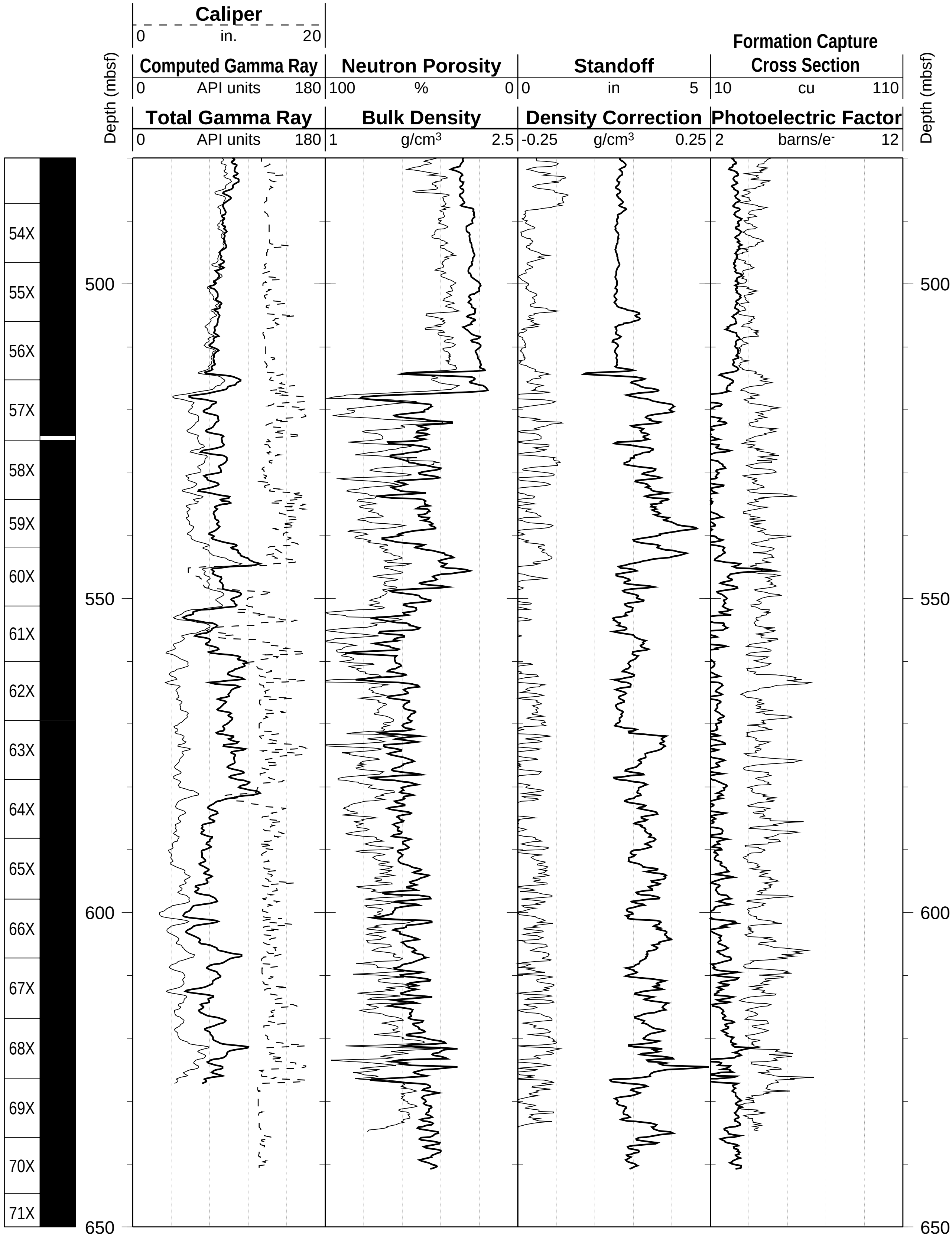
Hole 1073A: Natural Gamma Ray-Resistivity Logging Data (cont.)



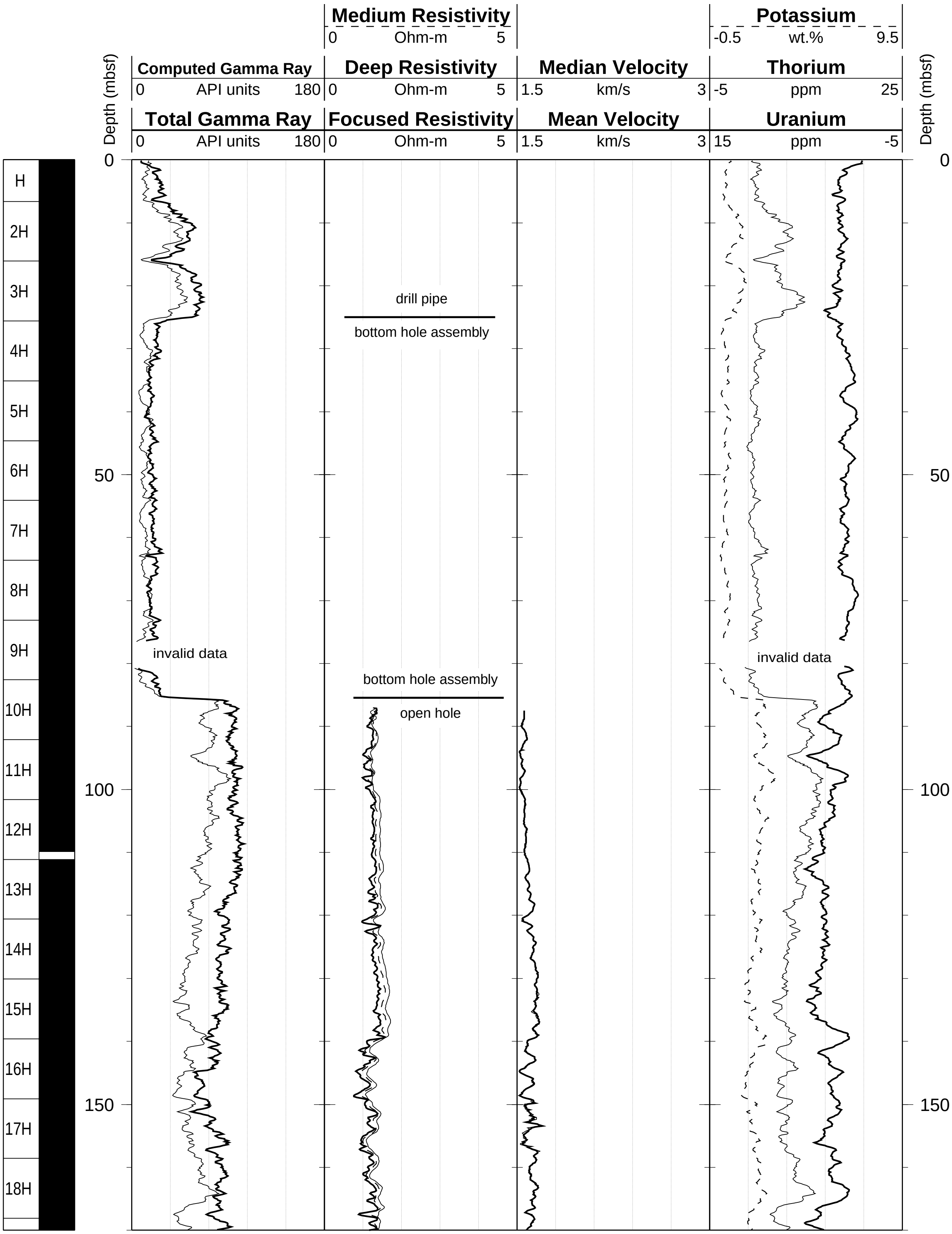
Hole 1073A: Natural Gamma Ray-Density-Porosity Logging Data



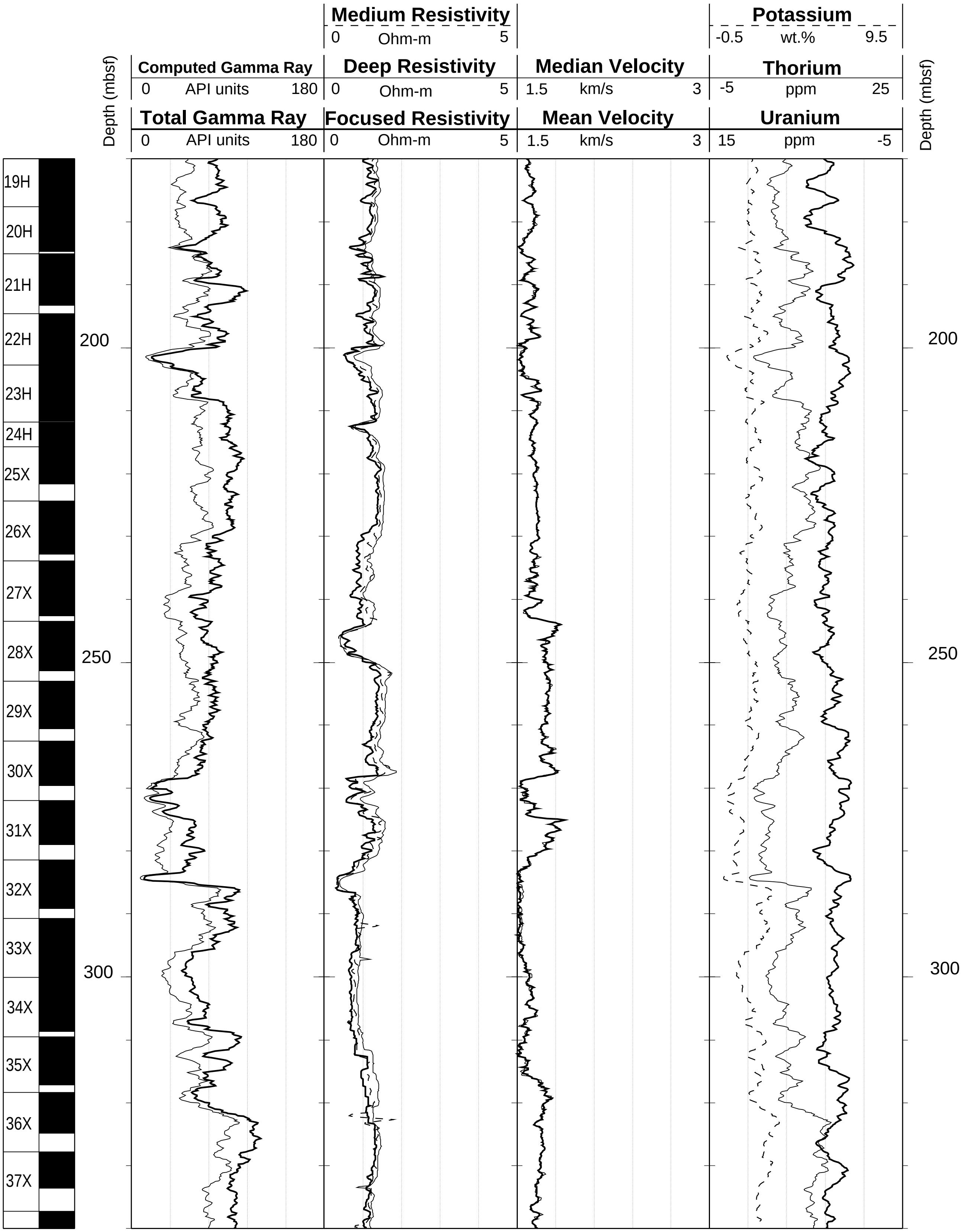
Hole 1073A: Natural Gamma Ray-Density-Porosity Logging Data (cont.)



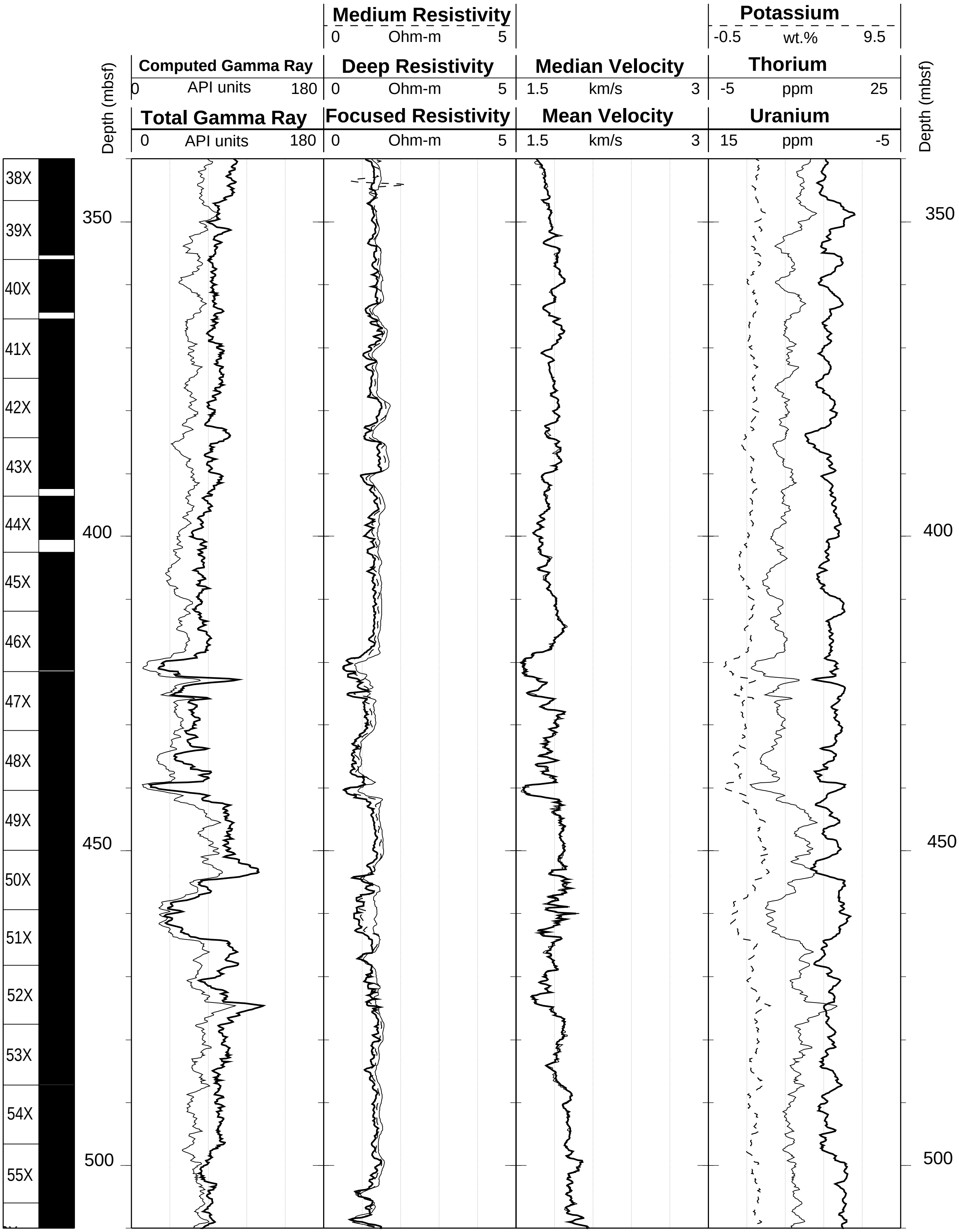
Hole 1073A: Natural Gamma Ray-Resistivity-Sonic Logging Data



Hole 1073A: Natural Gamma Ray-Resistivity-Sonic Logging Data (cont.)



Hole 1073A: Natural Gamma Ray-Resistivity-Sonic Logging Data (cont.)



Hole 1073A: Natural Gamma Ray-Resistivity-Sonic Logging Data (cont.)