SHORE-BASED LOG PROCESSING
HOLE 1039D

Bottom felt: 4362.5 mbrf (used for depth shift to seafloor)
Total penetration: 406.5 mbsf

Logging Tools

The logs were recorded using the logging-while-drilling (LWD) technique, which allows scientists to obtain open-hole logs during drilling operations. The advantages of this technique are many: real-time analysis can accelerate drilling speed, avoid stuck pipe, and reduce borehole problems. LWD can also collect data open-hole in the uppermost part of the hole; this cannot be accomplished with wireline tools as the drill string is usually kept in the upper part of the borehole where hole conditions are generally bad.

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 (−4362.5 m).

Gamma-ray data processing: Processing of the data is performed in real-time onboard by Schlumberger personnel. Gamma-ray data is measured as natural gamma ray (GR) and spectral gamma ray (NGT); during Leg 170 only the former has been corrected for hole size (bit size), collar size, and type of drilling fluid. Because of a bug 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 standoff, 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 deviated or enlarged boreholes 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 resolutions 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 mainly performed 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 eliminate mud standoff and to ensure proper contact with the borehole wall. A data quality indicator is given by the differential caliper (DCAL) channel, which measures the tool standoff during the recording. Another quality indicator is represented by the density correction (DRHO).

Additional information about LWD logs can be found in the “Explanatory Notes” and “Site 1039” chapters, this volume. For further questions about the logs, please contact:

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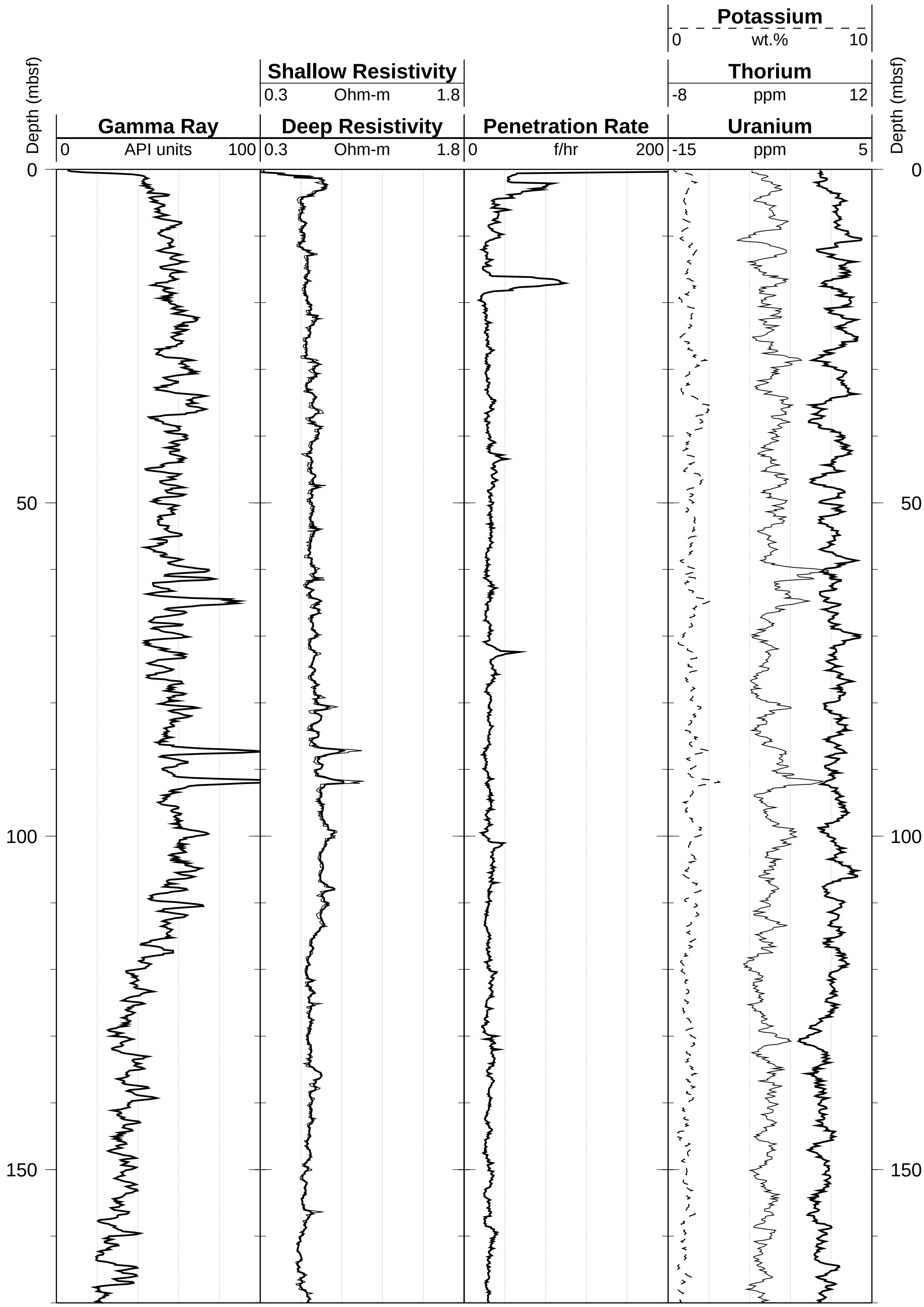
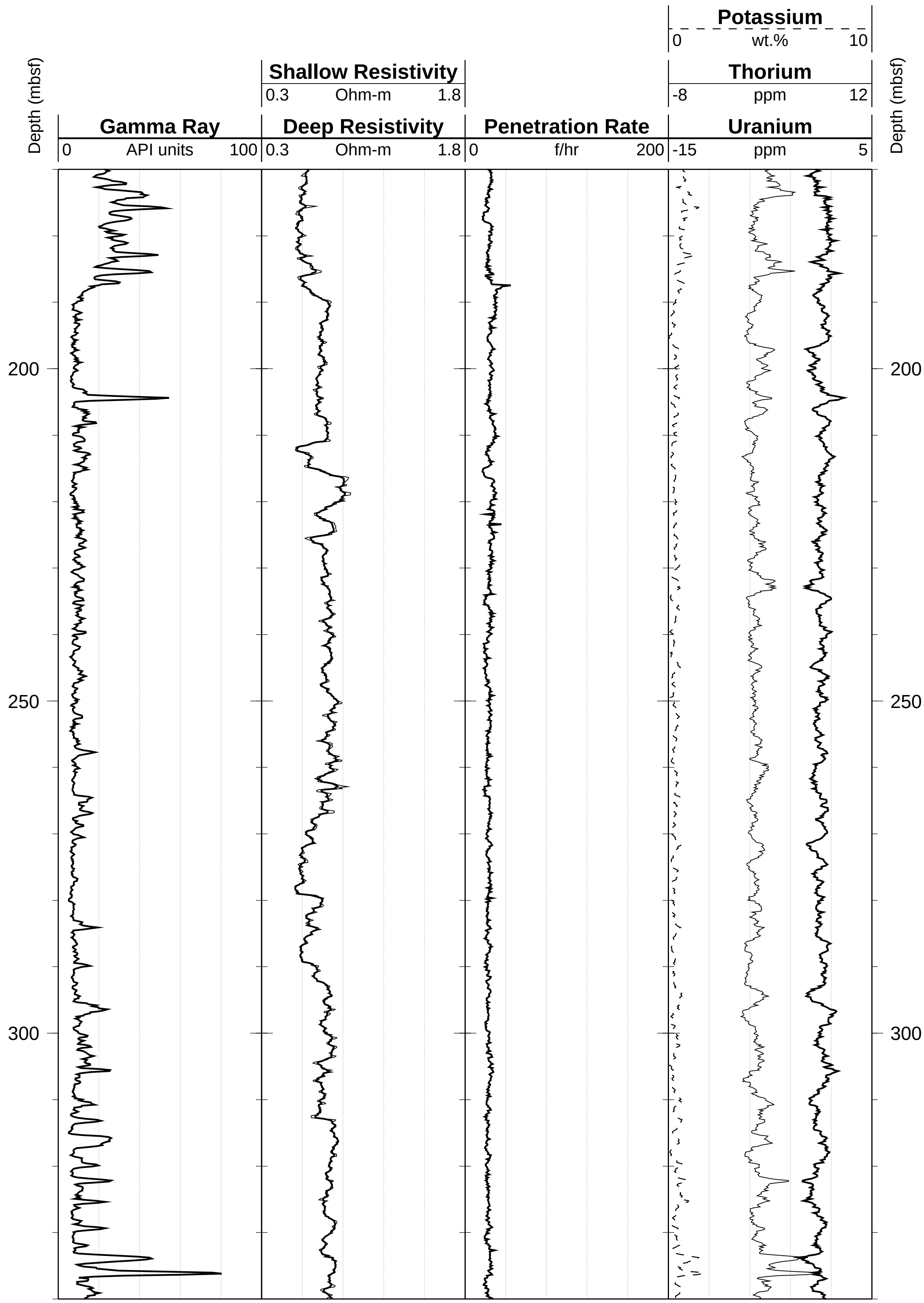
Phone: 914-365-8343
Fax: 914-365-3182
E-mail: chris@ldeo.columbia.edu

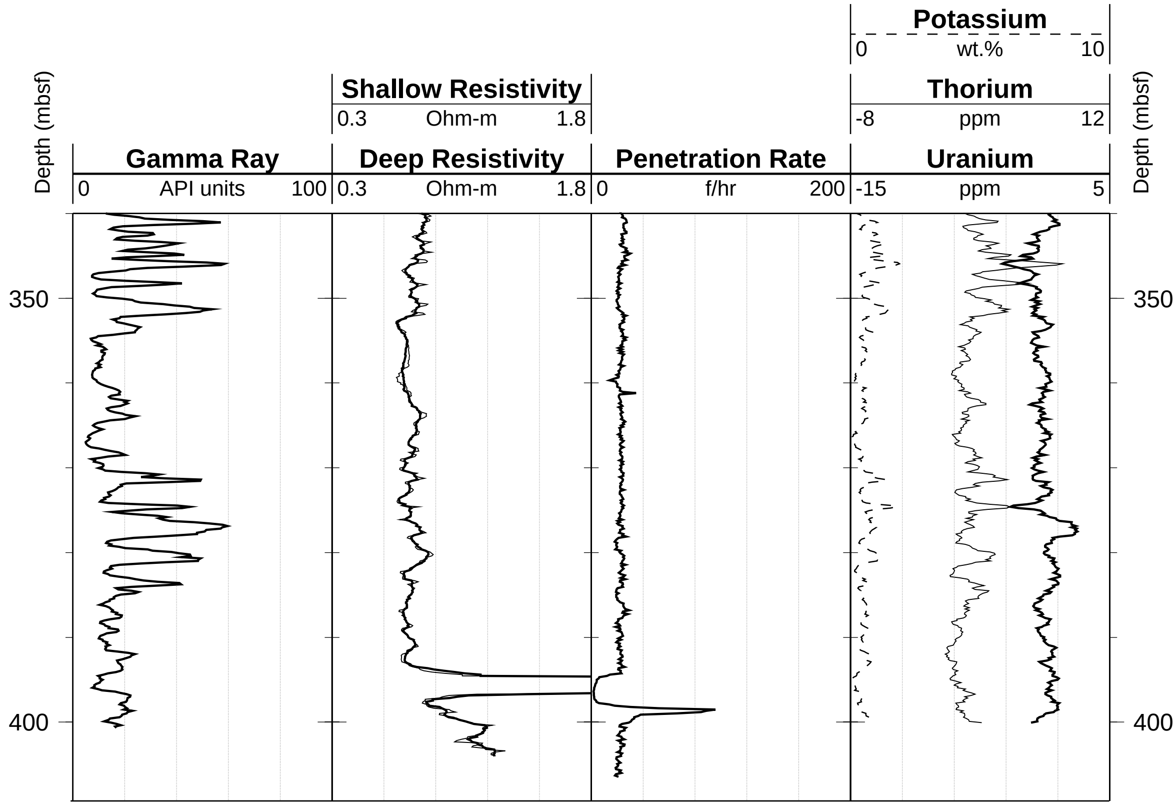
Hole 1039D: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data



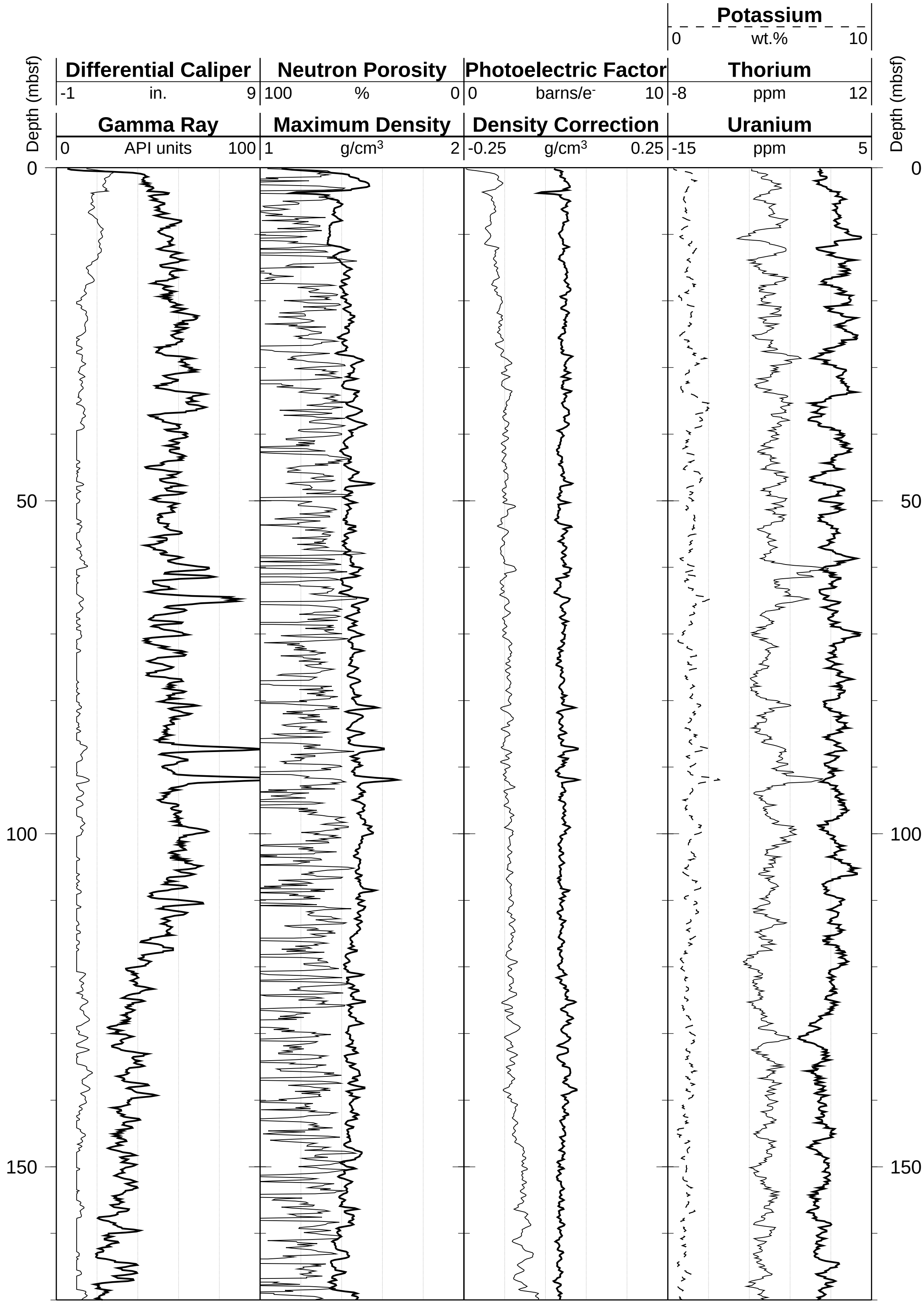
Hole 1039D: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data (cont.)



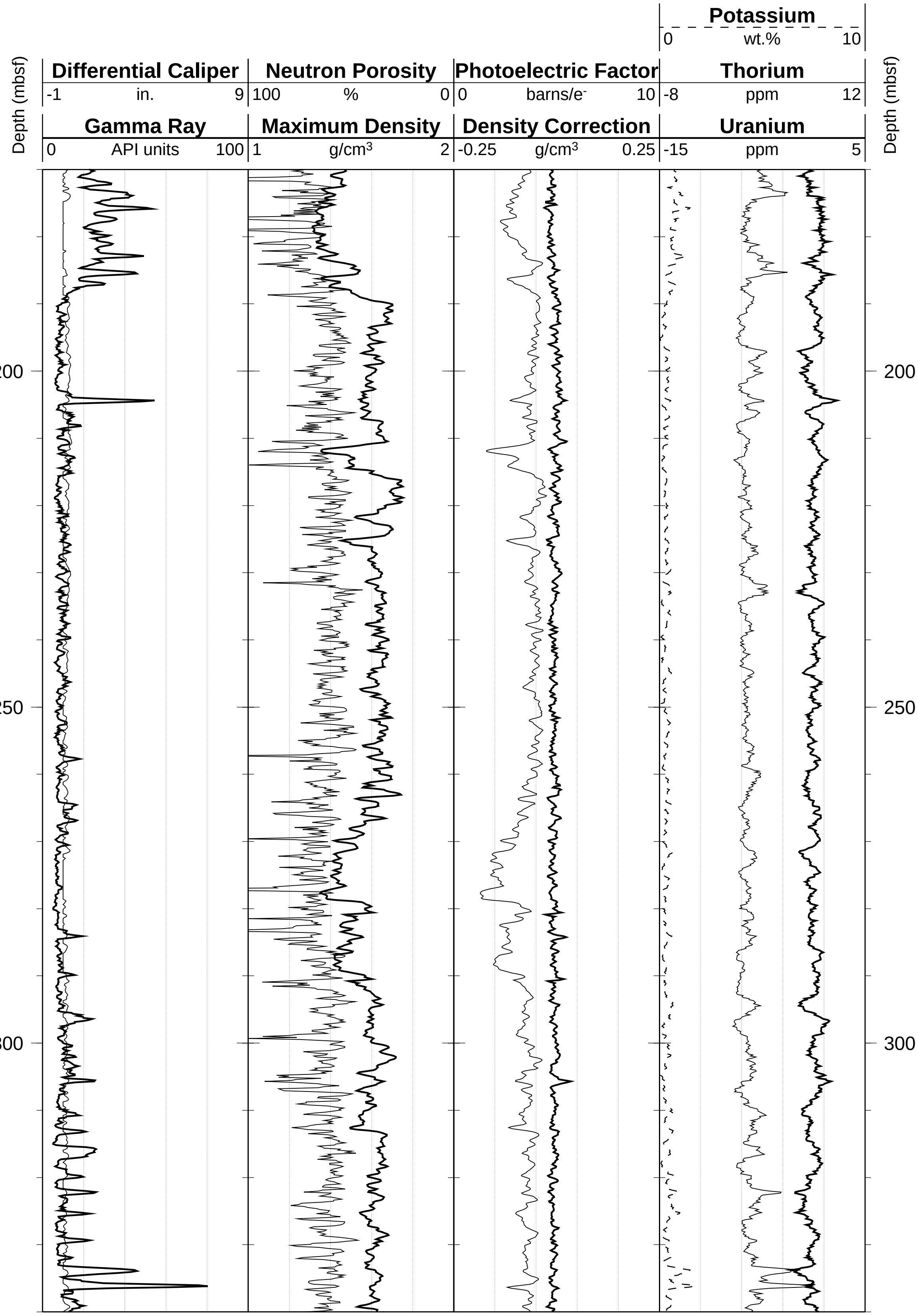
Hole 1039D: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data (cont.)



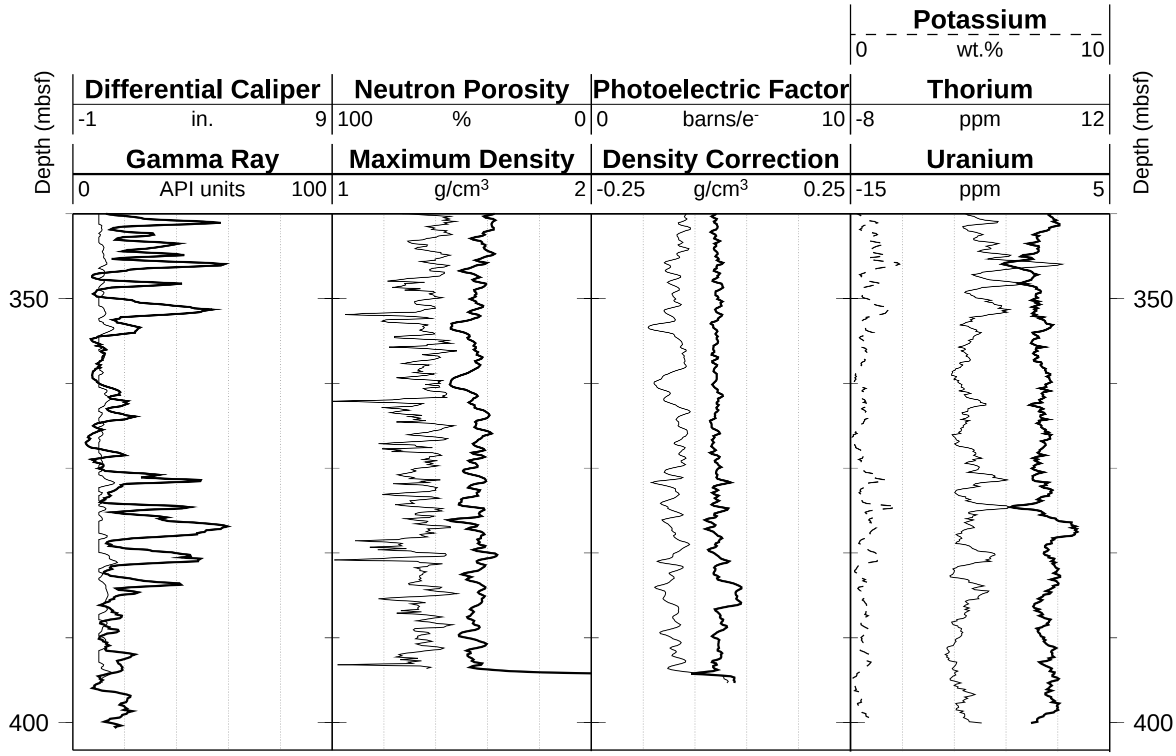
Hole 1039D: LWD Natural Gamma Ray-Density-Porosity Logging Data



Hole 1039D: LWD Natural Gamma Ray-Density-Porosity Logging Data (cont.)



Hole 1039D: LWD Natural Gamma Ray-Density-Porosity Logging Data (cont.)



SHORE-BASED LOG PROCESSING

HOLE 1040C

Bottom felt: 4189 mbrf
Total penetration: 665 mbsf
Total core recovered: 377.3 m (74.6 %)

Logging Runs

Logging string 1: DIT/SDT/HLDT/GPIT/NGT

Wireline heave compensator was used to counter ship heave. The hole was deviated from the vertical; maximum deviation observed while logging was 11°.

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 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/SDT/HLDT/GPIT/NGT: Bottom-hole assembly at ~87 mbsf.

Processing

Depth shift: No differential depth shift was necessary as only one logging pass was recorded. The amount of depth shift to the seafloor (−4184m) differs 5 m from the drillers’ water depth; it corresponds to the depth of the seafloor as it is seen on the logs.

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

Acoustic data processing: The array sonic tool was operated in standard depth-derived borehole compensated mode, including long-spacing (8-10-10-12 ft) logs. The sonic logs have been processed to eliminate some of the noise and cycle skipping experienced during the recording.

Quality Control

Invalid spikes were frequently recorded (PEF curve) throughout the hole.

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 on the HLDT tool (CALI).

Details of standard shore-based processing procedures are found in the “Explanatory Notes” chapter, this volume. For further information about the logs, please contact:

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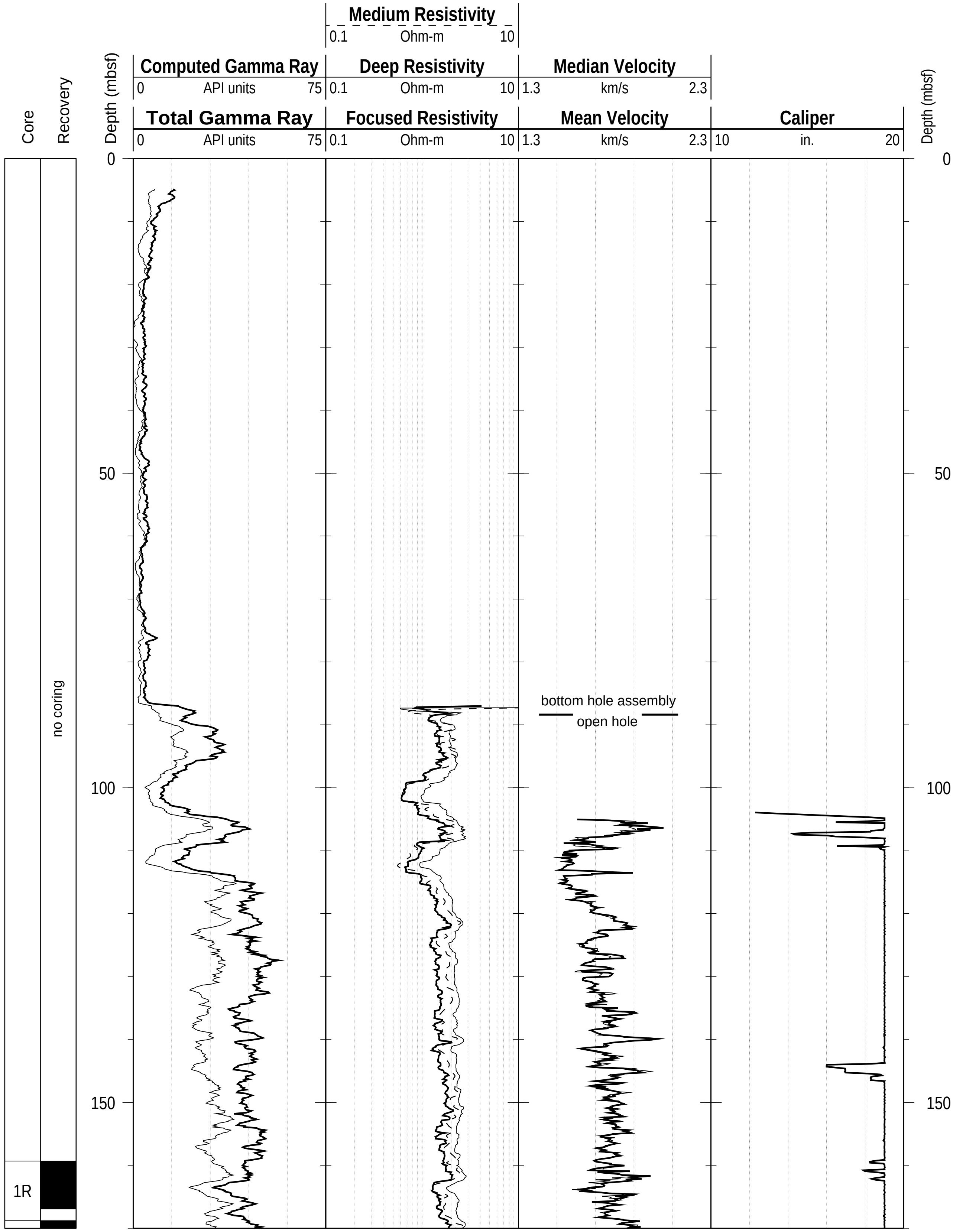
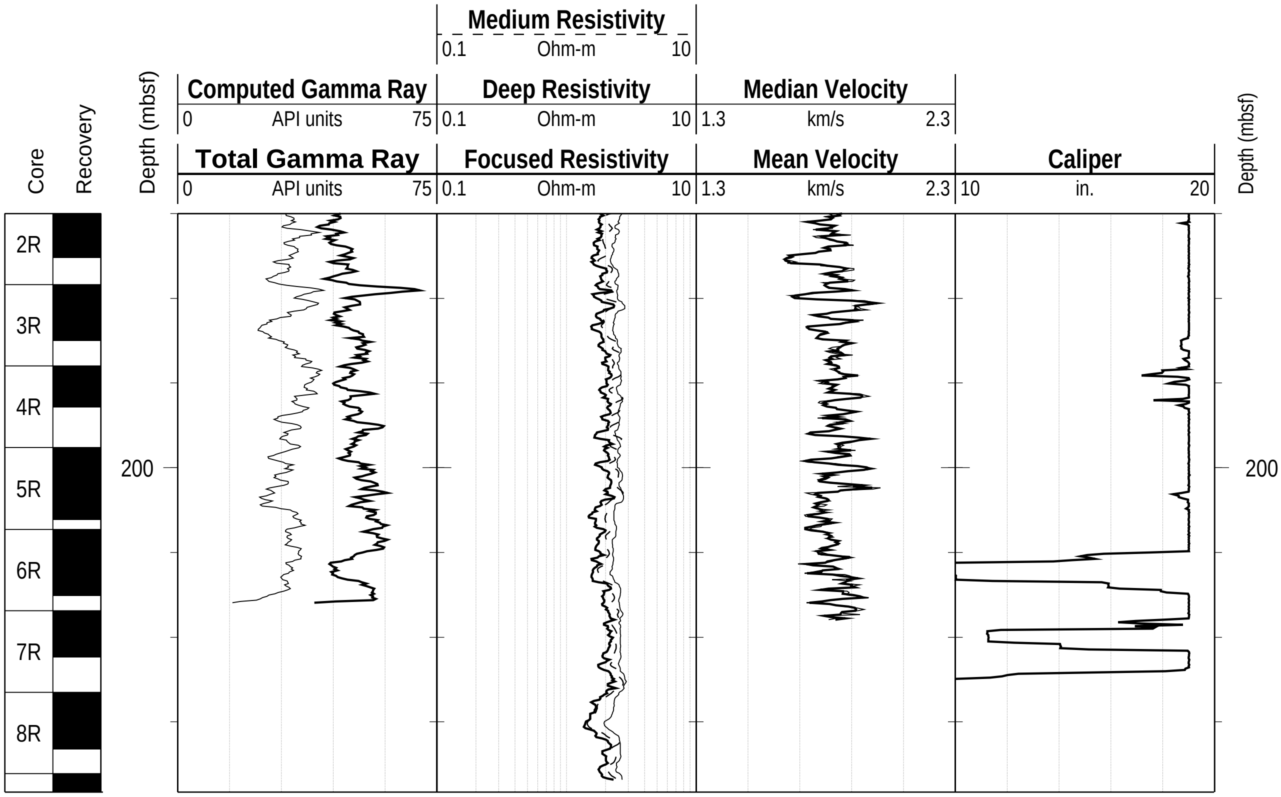
E-mail: chris@ldeo.columbia.edu

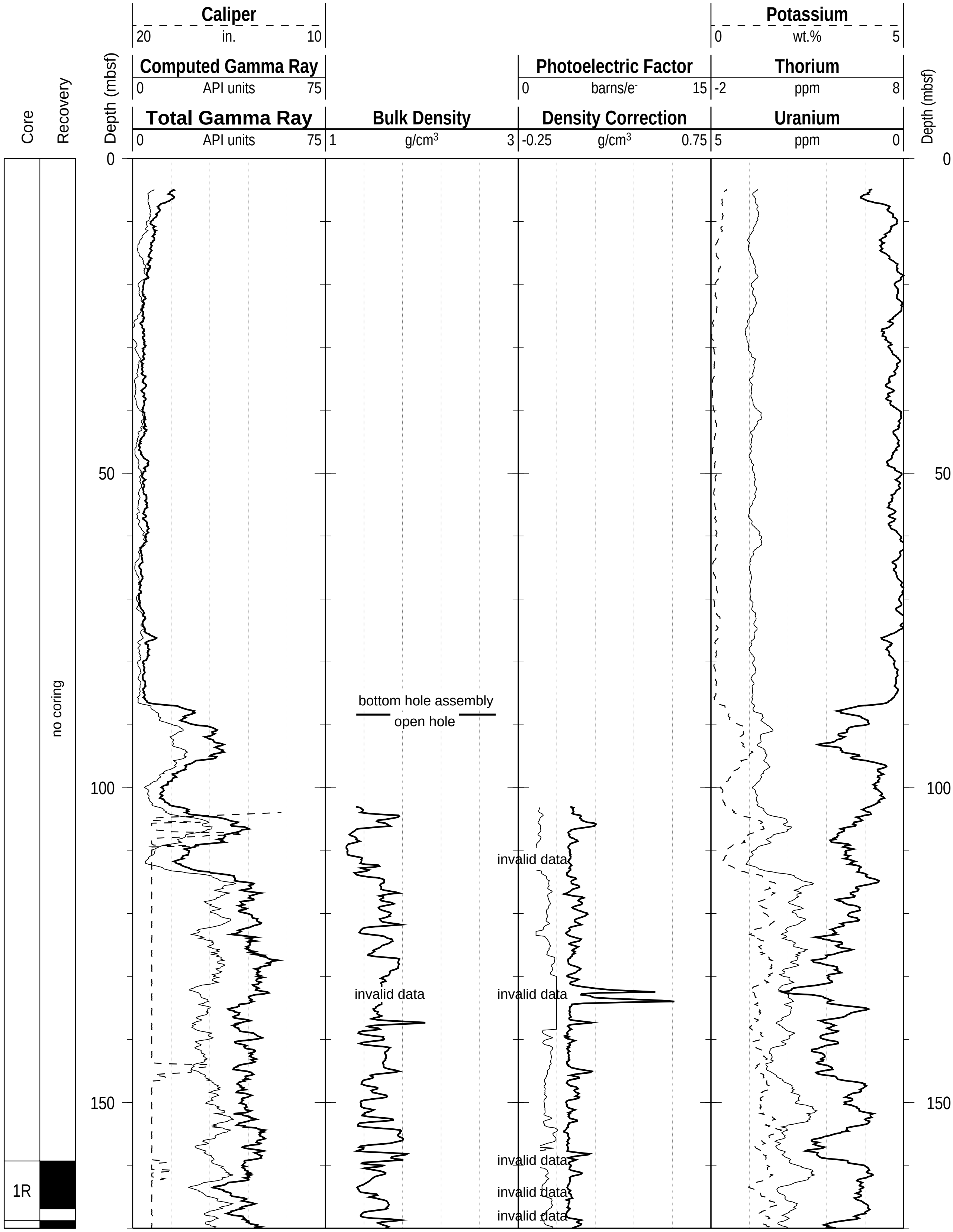
Hole 1040C: Natural Gamma Ray-Resistivity-Sonic Logging Data



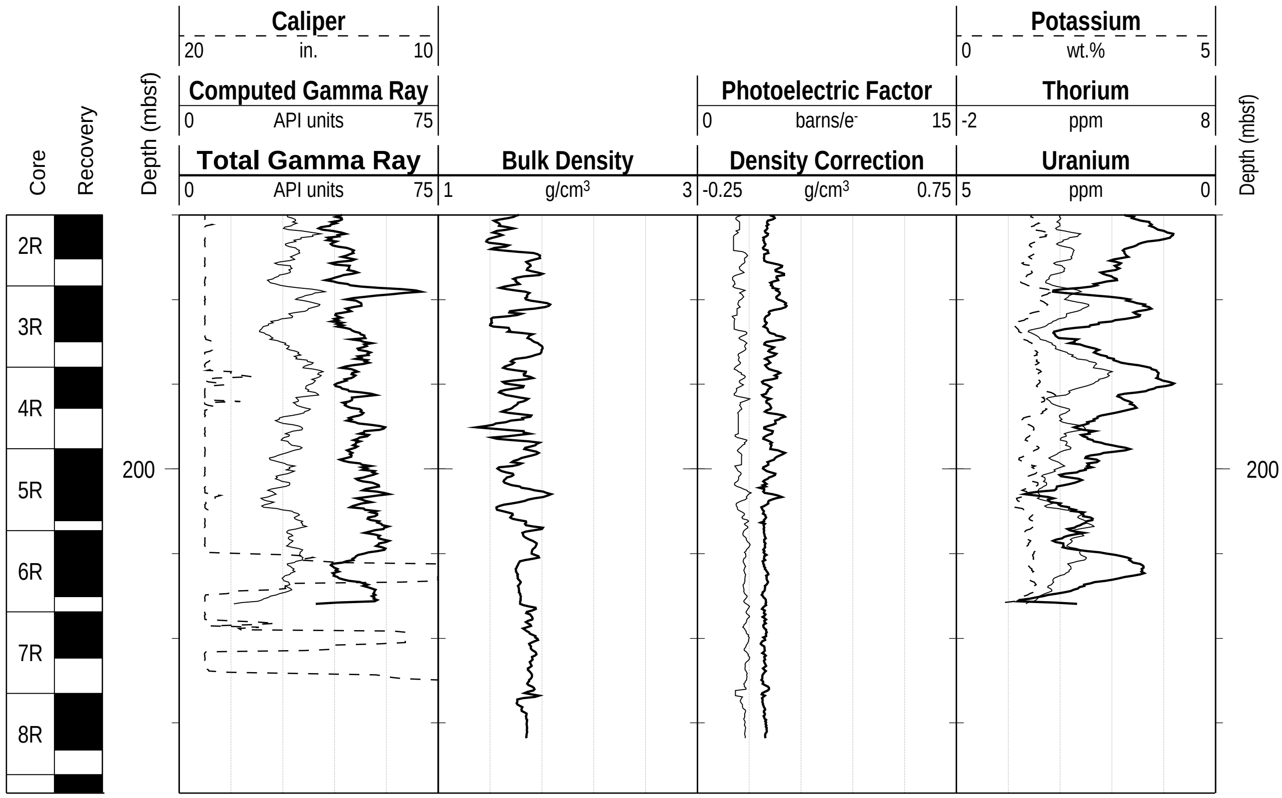
Hole 1040C: Natural Gamma Ray-Resistivity-Sonic Logging Data (cont.)



Hole 1040C: Natural Gamma Ray-Density-Porosity Logging Data



Hole 1040C: Natural Gamma Ray-Density-Porosity Logging Data (cont.)



SHORE-BASED LOG PROCESSING
HOLE 1040D

Bottom felt: 4189 mbrf (used for depth shift to seafloor)
Total penetration: 337 mbsf

Logging Tools

The logs were recorded using the logging-while-drilling (LWD) technique, which allows scientists to obtain open-hole logs during drilling operations. The advantages of this technique are many: real-time analysis can accelerate drilling speed, avoid stuck pipe, and reduce borehole problems. LWD can also collect data open-hole in the uppermost part of the hole; this cannot be accomplished with wireline tools as the drill string is usually kept in the upper part of the borehole where hole conditions are generally bad.

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 (– 4189 m).

Gamma-ray data processing: Processing of the data is performed in real-time onboard by Schlumberger personnel. Gamma-ray data is measured as natural gamma ray (GR) and spectral gamma ray (NGT); during Leg 170 only the former has been corrected for hole size (bit size), collar size, and type of drilling fluid. Because of a bug 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 standoff, 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 deviated or enlarged boreholes 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 resolutions 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 mainly performed 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 eliminate mud standoff and to ensure proper contact with the borehole wall. A data quality indicator is given by the differential caliper (DCAL) channel, which measures the tool standoff during the recording. Another quality indicator is represented by the density correction (DRHO).

Additional information about LWD logs can be found in the "Explanatory Notes" and the "Site 1040" chapters, this volume. For further questions about the logs, please contact:

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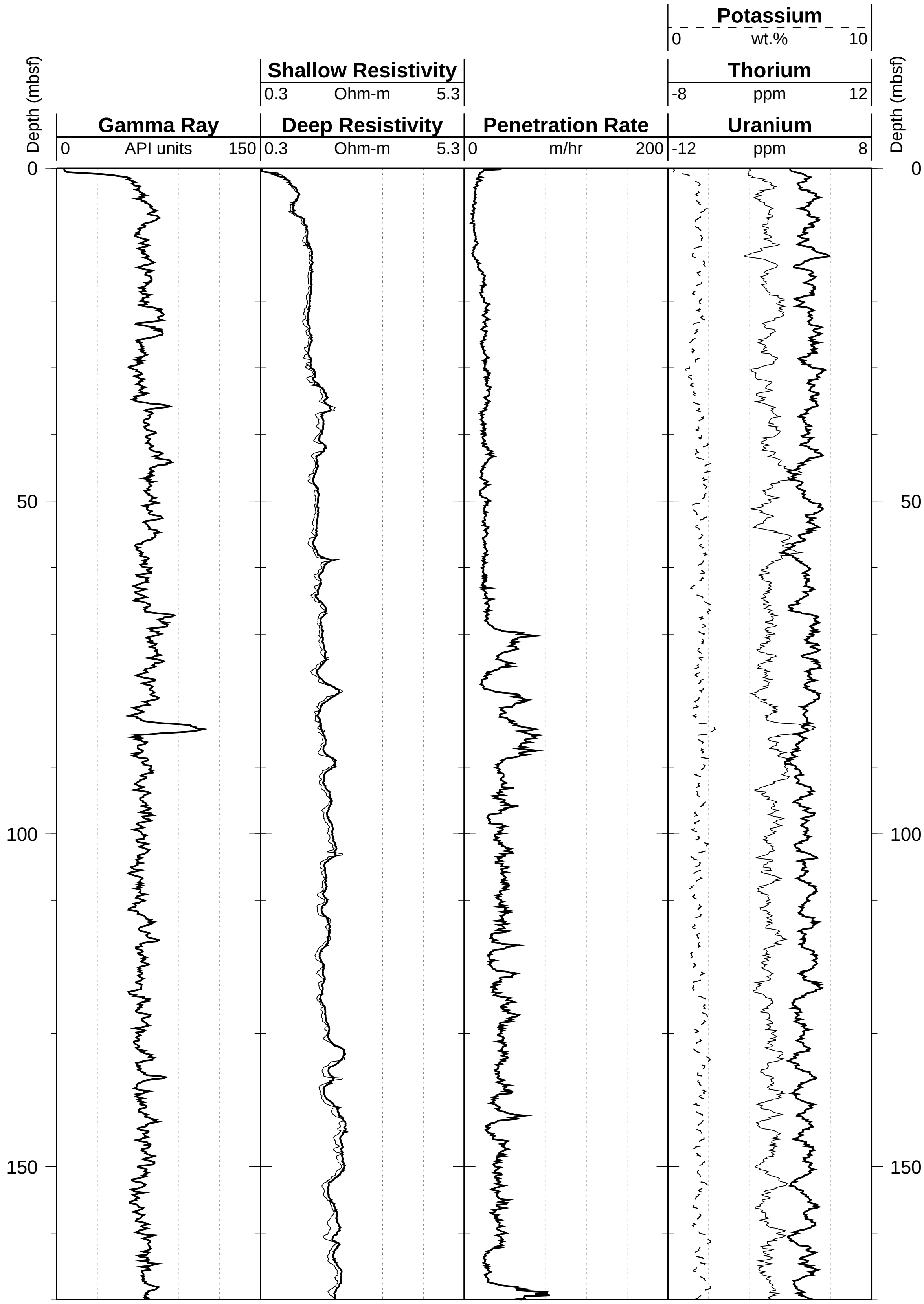
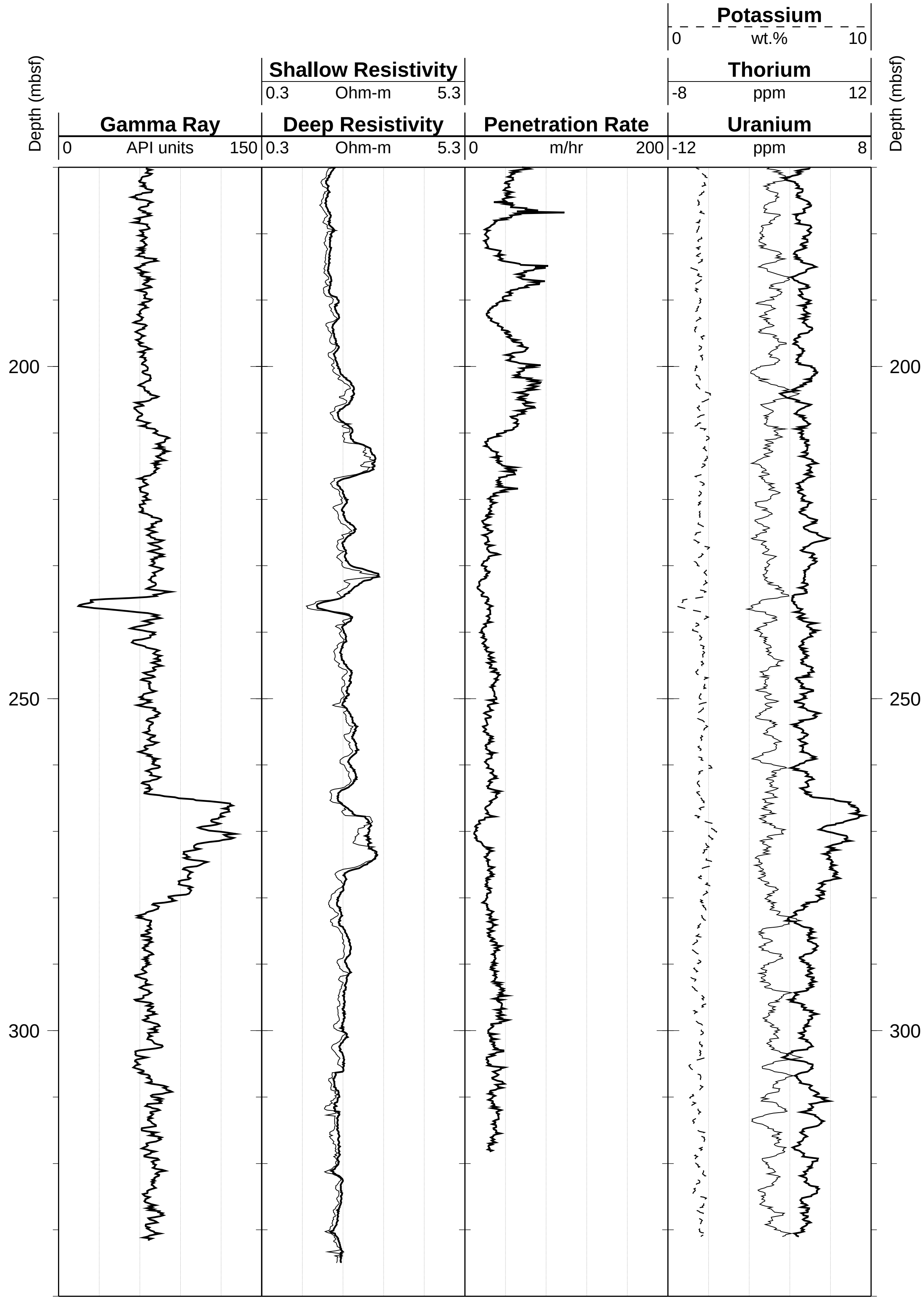
E-mail: chris@ldeo.columbia.edu

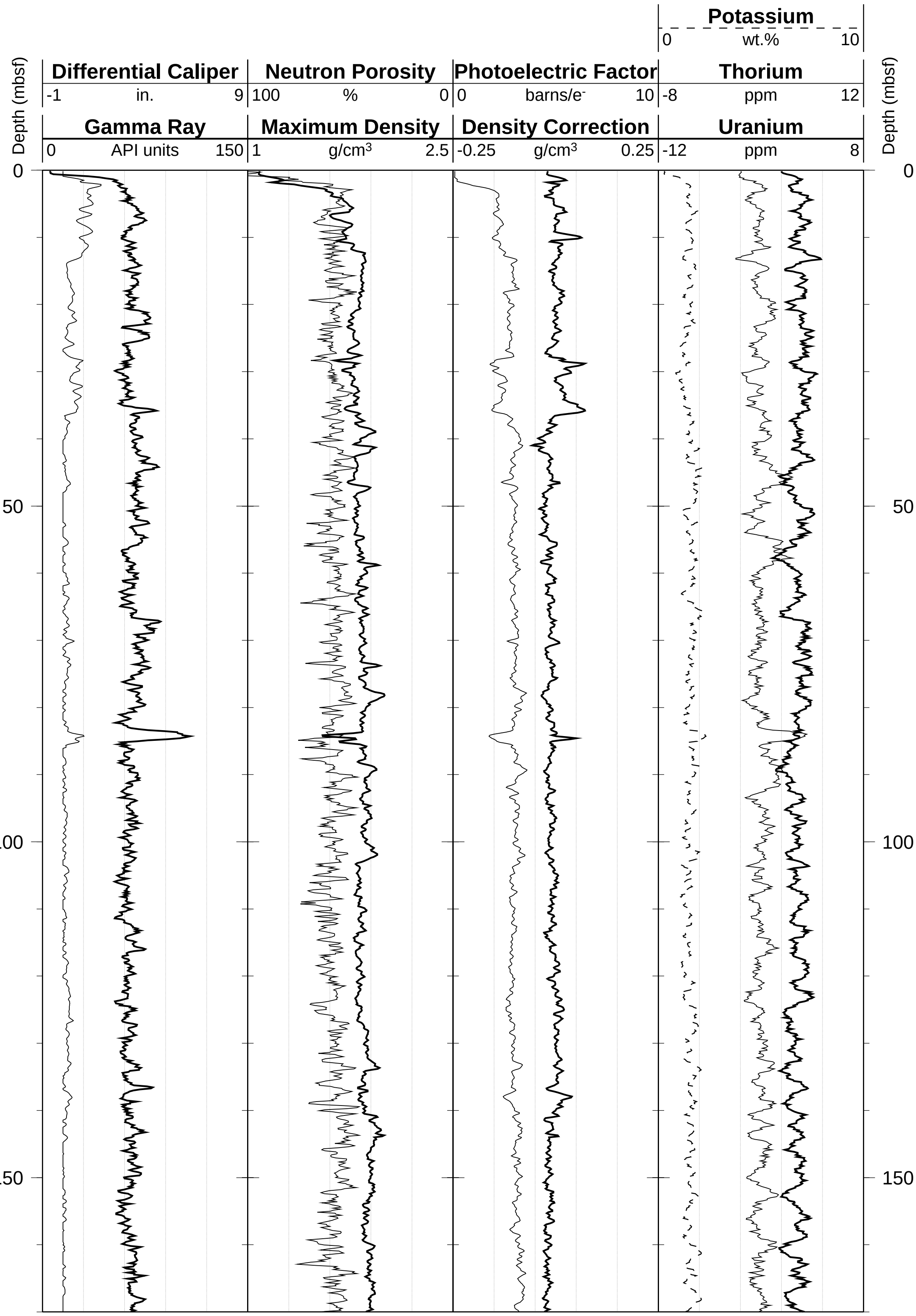
Hole 1040D: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data



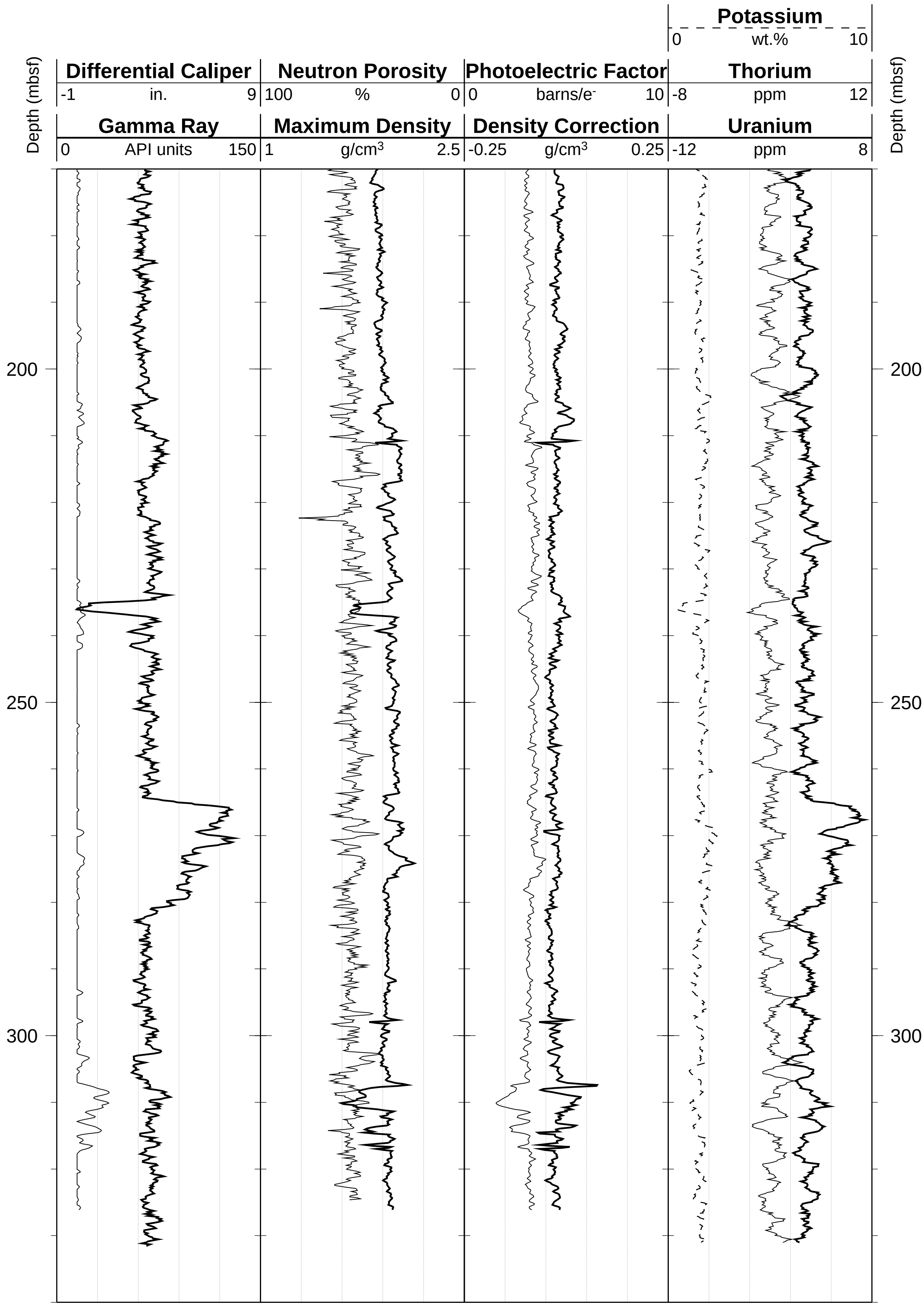
Hole 1040D: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data (cont.)



Hole 1040D: LWD Natural Gamma Ray-Density-Porosity Logging Data



Hole 1040D: LWD Natural Gamma Ray-Density-Porosity Logging Data (cont.)



SHORE-BASED LOG PROCESSING
HOLE 1040E

Bottom felt: 4189 mbrf (used for depth shift to seafloor)
Total penetration: 318 mbsf

Logging Tools

The logs were recorded using the logging-while-drilling (LWD) technique, which allows scientists to obtain open-hole logs during drilling operations. The advantages of this technique are many: real-time analysis can accelerate drilling speed, avoid stuck pipe, and reduce borehole problems. LWD can also collect data open-hole in the uppermost part of the hole; this cannot be accomplished with wireline tools as the drill string is usually kept in the upper part of the borehole where hole conditions are generally bad.

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 (−4189 m).

Gamma-ray data processing: Processing of the data is performed in real-time onboard by Schlumberger personnel. Gamma-ray data is measured as natural gamma ray (GR) and spectral gamma ray (NGT); during Leg 170 only the former has been corrected for hole size (bit size), collar size, and type of drilling fluid. Because of a bug 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 standoff, 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 deviated or enlarged boreholes 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 resolutions 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 mainly performed 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 eliminate mud standoff and to ensure proper contact with the borehole wall. A data quality indicator is given by the differential caliper (DCAL) channel, which measures the tool standoff during the recording. Another quality indicator is represented by the density correction (DRHO).

Additional information about LWD logs can be found in the “Explanatory Notes” and the “Site 1040” chapters, this volume. For further questions about the logs, please contact:

Cristina Broglia
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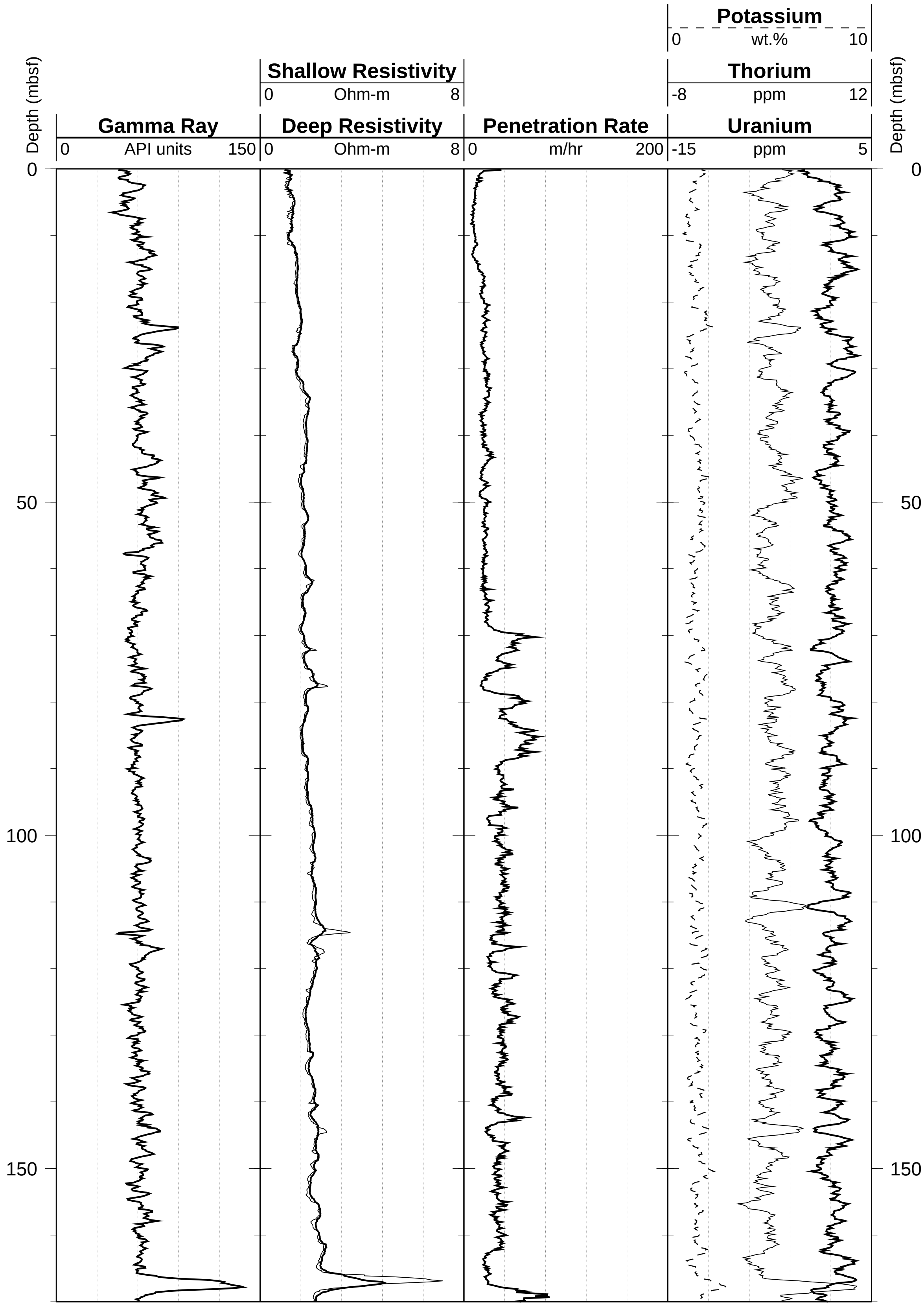
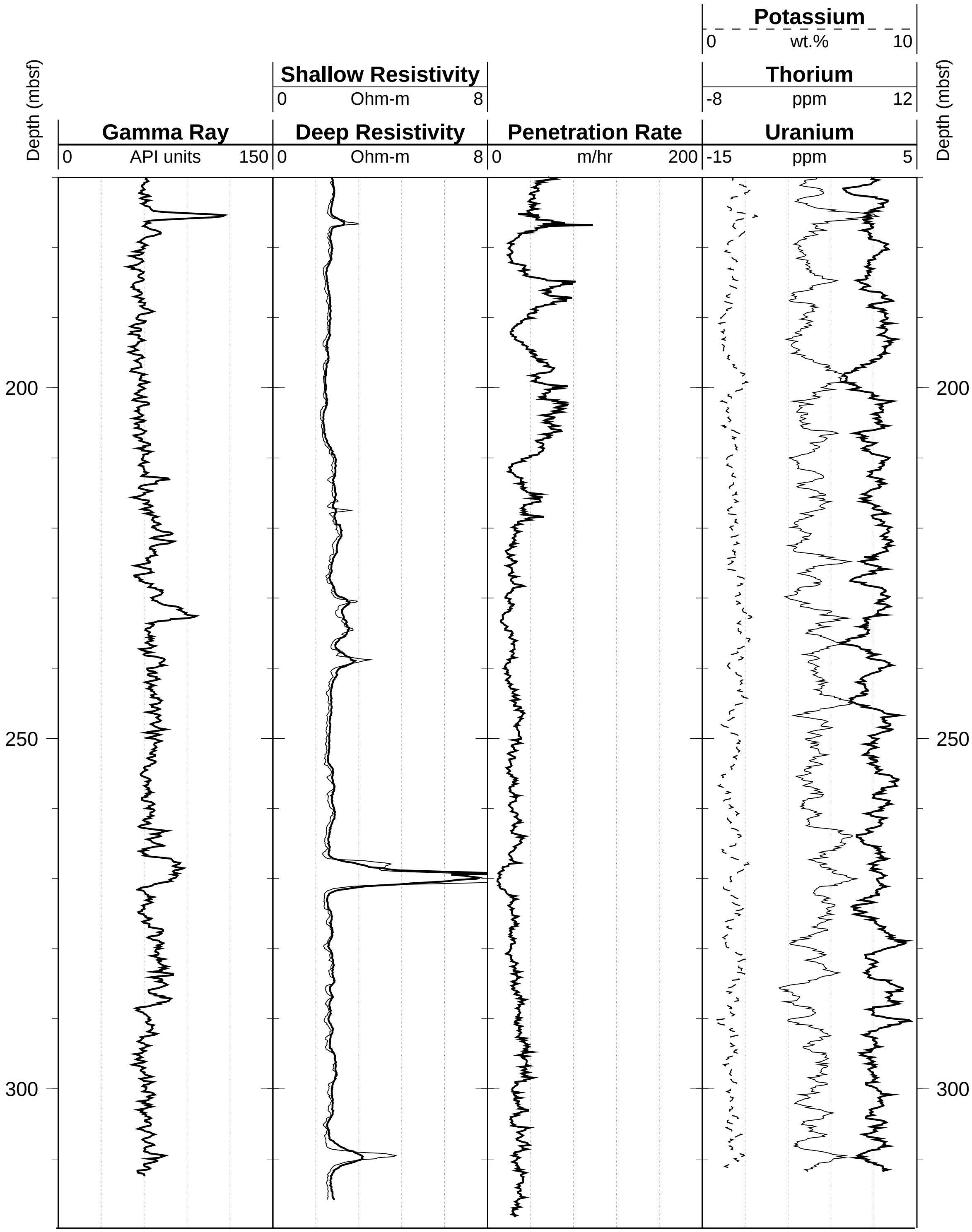
Fax: 914-365-3182
E-mail: chris@ldeo.columbia.edu

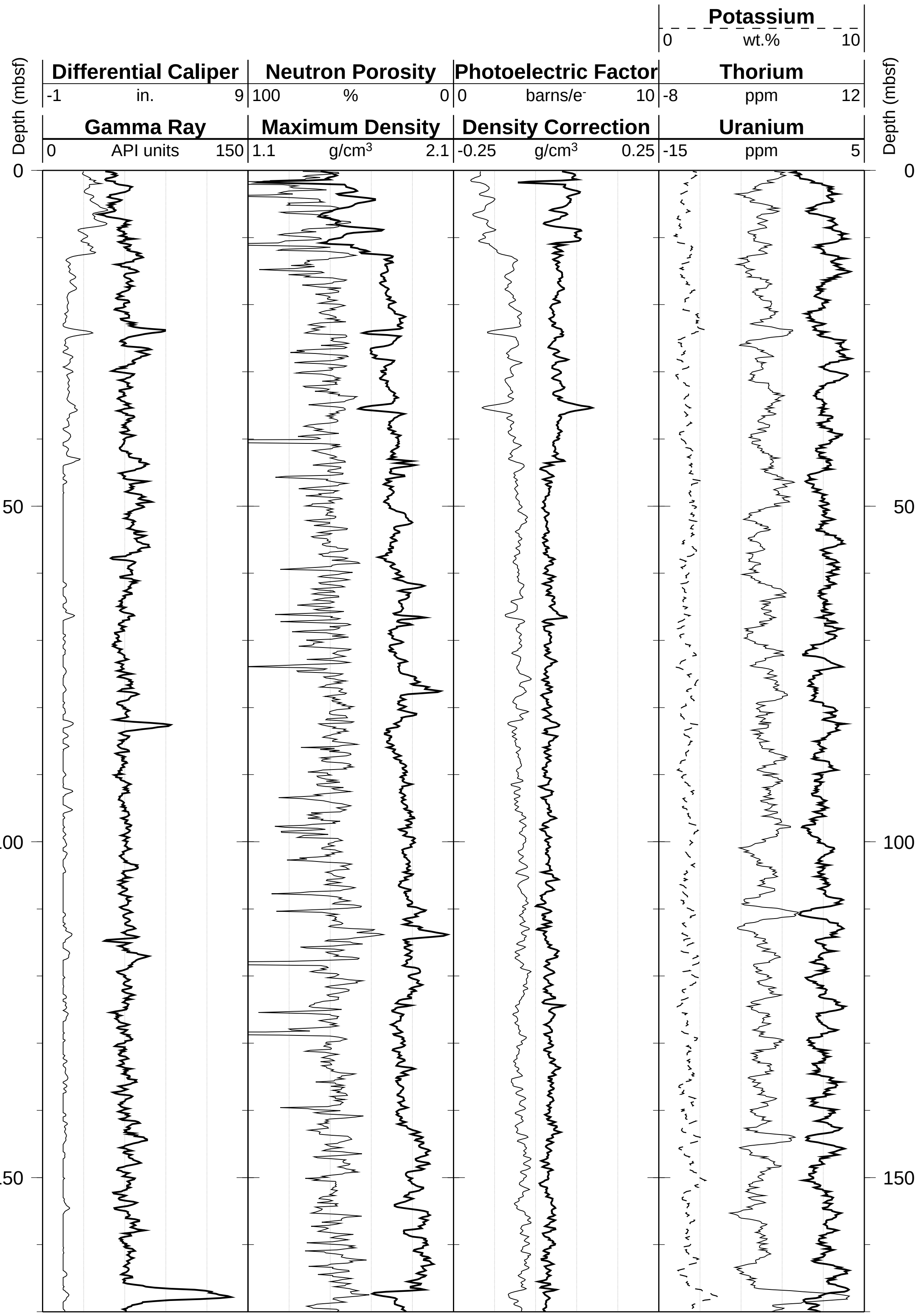
Hole 1040E: LWD Natural Gamma Ray-Resistivity-Sonic Logging Data



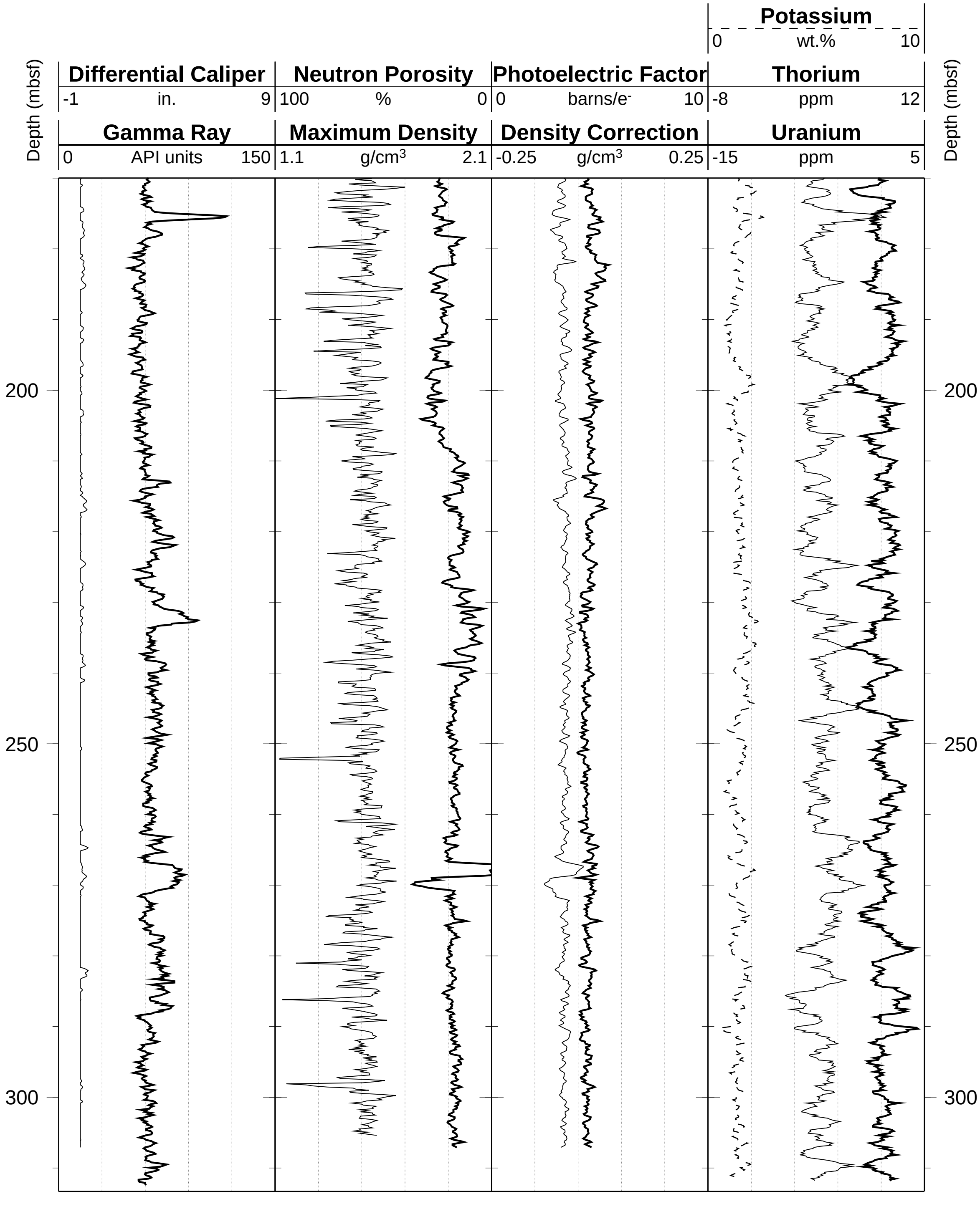
Hole 1040E: LWD Natural Gamma Ray-Resistivity-Sonic Logging Data (cont.)



Hole 1040E: LWD Natural Gamma Ray-Density-Porosity Logging Data



Hole 1040E: LWD Natural Gamma Ray-Density-Porosity Logging Data (cont.)



SHORE-BASED LOG PROCESSING

HOLE 1042C

Bottom felt: 3585 mbrf (used for depth shift to seafloor)
Total penetration: 297 mbsf

Logging Tools

The logs were recorded using the logging-while-drilling (LWD) technique, which allows scientists to obtain open-hole logs during drilling operations. The advantages of this technique are many: real-time analysis can accelerate drilling speed, avoid stuck pipe, and reduce borehole problems. LWD can also collect data open-hole in the uppermost part of the hole; this cannot be accomplished with wireline tools as the drill string is usually kept in the upper part of the borehole where hole conditions are generally bad.

At Hole 1042C only the CDR = compensated dual resistivity (resistivity-gamma ray) was used.

Processing

Depth shift: Original logs have been depth shifted to the seafloor (–3585 m).

Gamma-ray data processing: Processing of the data is performed in real-time onboard by Schlumberger personnel. Gamma-ray data is measured as natural gamma ray (GR) and spectral gamma ray (NGT); during Leg 170 only the former has been corrected for hole size (bit size), collar size, and type of drilling fluid. Because of a bug 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.

Resistivity data processing: A deconvolution technique called "qualitative resistivity overlay" aimed at providing enhanced vertical resolutions 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 mainly performed 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 eliminate mud standoff and to ensure proper contact with the borehole wall. A data quality indicator is given by the differential caliper (DCAL) channel, which measures the tool standoff during the recording. Another quality indicator is represented by the density correction (DRHO).

Additional information about LWD logs can be found in the "Explanatory Notes" and "Site 1042" chapters, this volume. For further questions about the logs, please contact:

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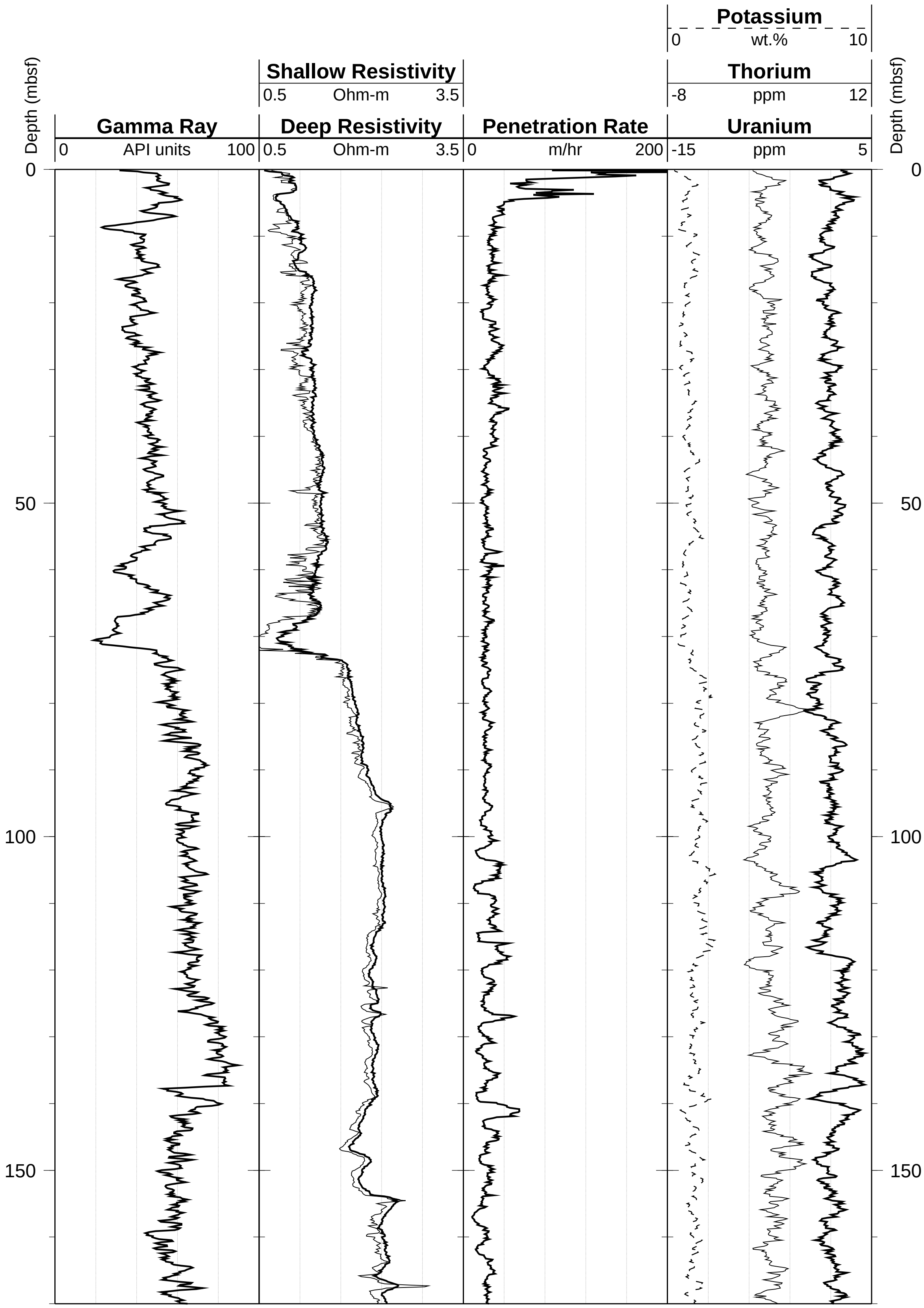
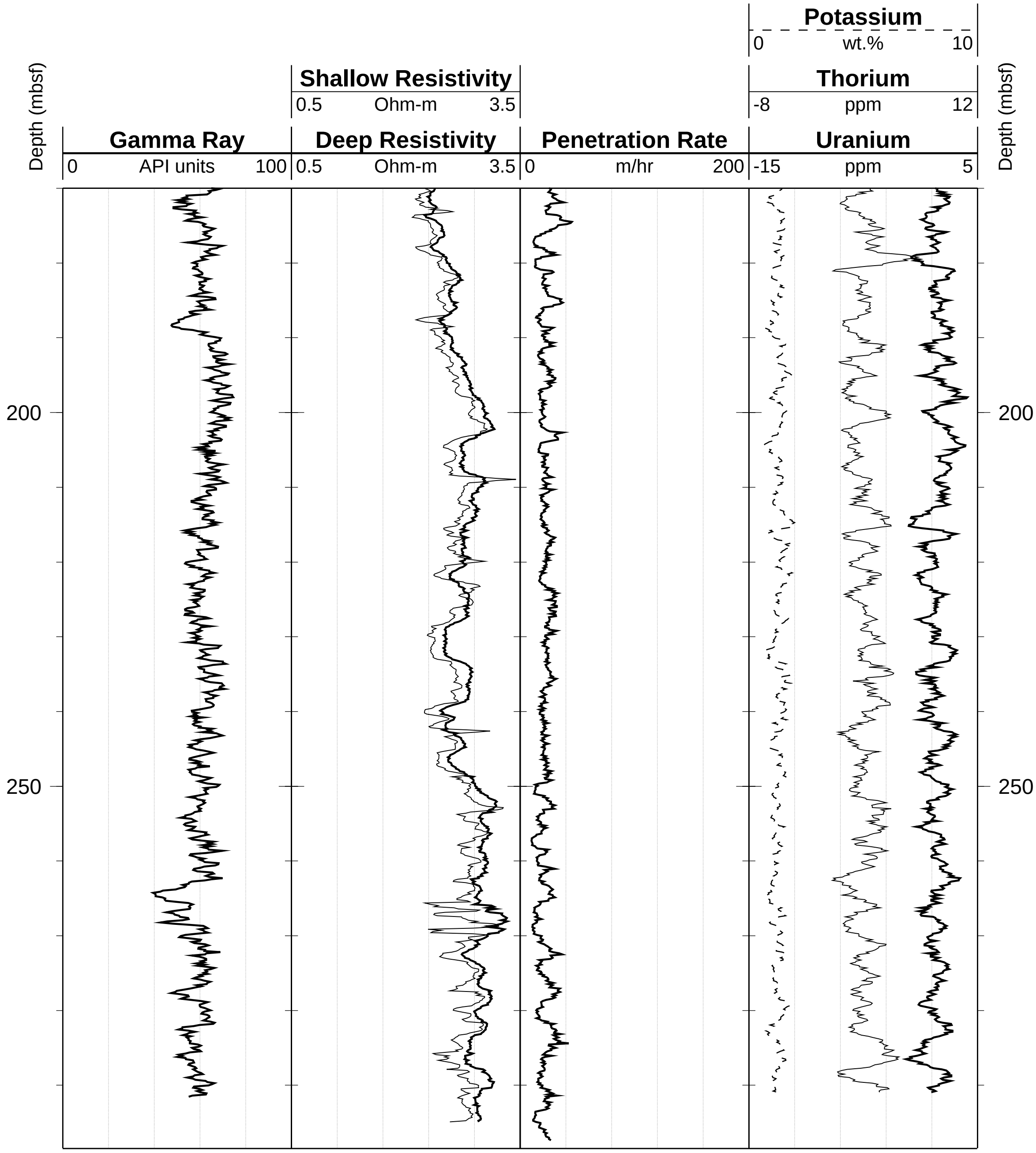
E-mail: chris@ldeo.columbia.edu

Hole 1042C: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data



Hole 1042C: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data (cont.)



SHORE-BASED LOG PROCESSING
HOLE 1043B

Bottom felt: 4319 mbrf (used for depth shift to seafloor)
Total penetration: 482 mbsf

Logging Tools

The logs were recorded using the logging-while-drilling (LWD) technique, which allows scientists to obtain open-hole logs during drilling operations. The advantages of this technique are many: real-time analysis can accelerate drilling speed, avoid stuck pipe, and reduce borehole problems. LWD can also collect data open-hole in the uppermost part of the hole; this cannot be accomplished with wireline tools as the drill string is usually kept in the upper part of the borehole where hole conditions are generally bad.

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 (−4319 m).

Gamma-ray data processing: Processing of the data is performed in real-time onboard by Schlumberger personnel. Gamma-ray data is measured as natural gamma ray (GR) and spectral gamma ray (NGT); during Leg 170 only the former has been corrected for hole size (bit size), collar size, and type of drilling fluid. Because of a bug 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 standoff, 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 deviated or enlarged boreholes 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 resolutions 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 mainly performed 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 eliminate mud standoff and to ensure proper contact with the borehole wall. A data quality indicator is given by the differential caliper (DCAL) channel, which measures the tool standoff during the recording. Another quality indicator is represented by the density correction (DRHO).

Additional information about LWD logs can be found in the "Explanatory Notes" and "Site 1043" chapters, this volume. For further questions about the logs, please contact:

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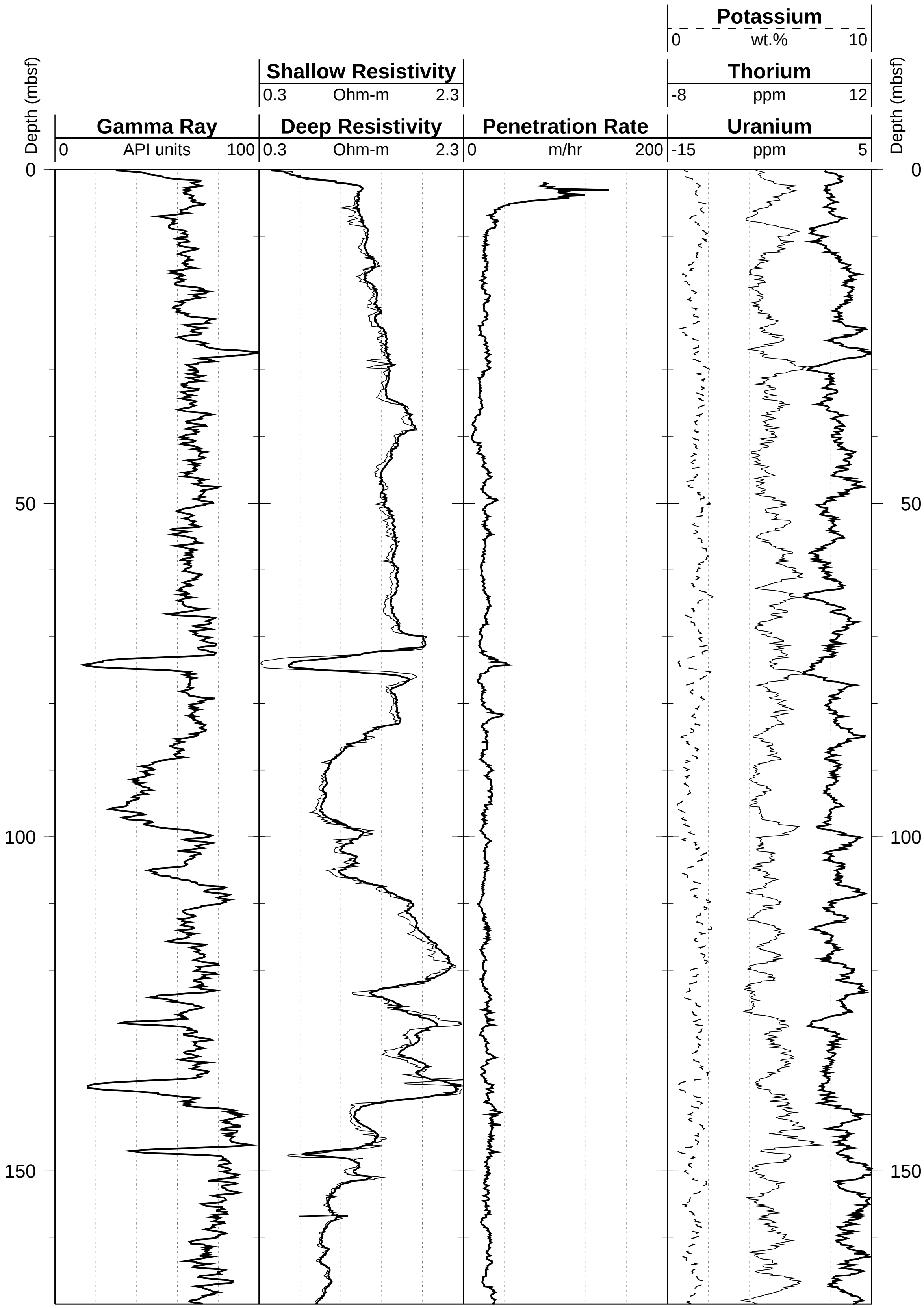
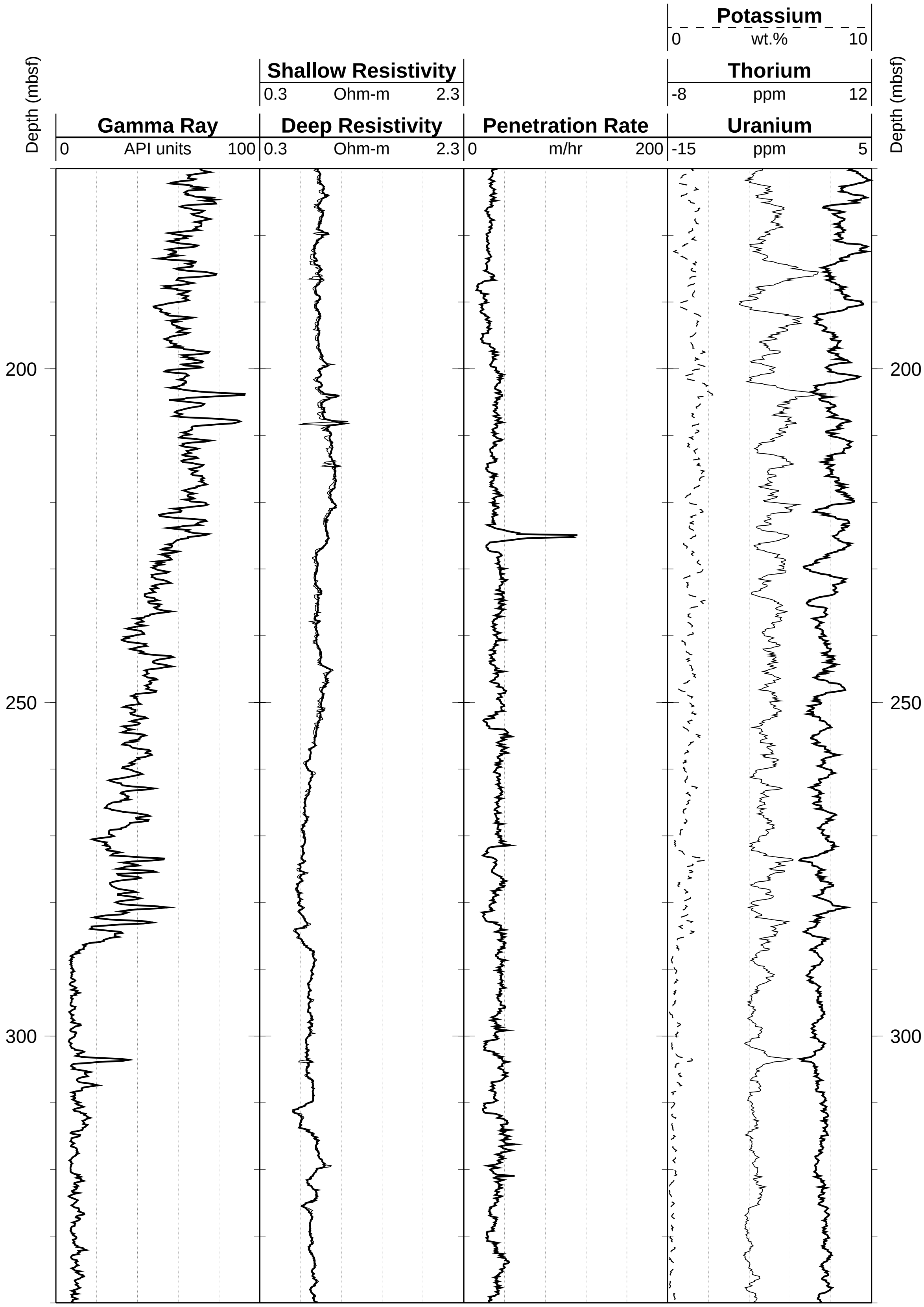
E-mail: chris@ldeo.columbia.edu

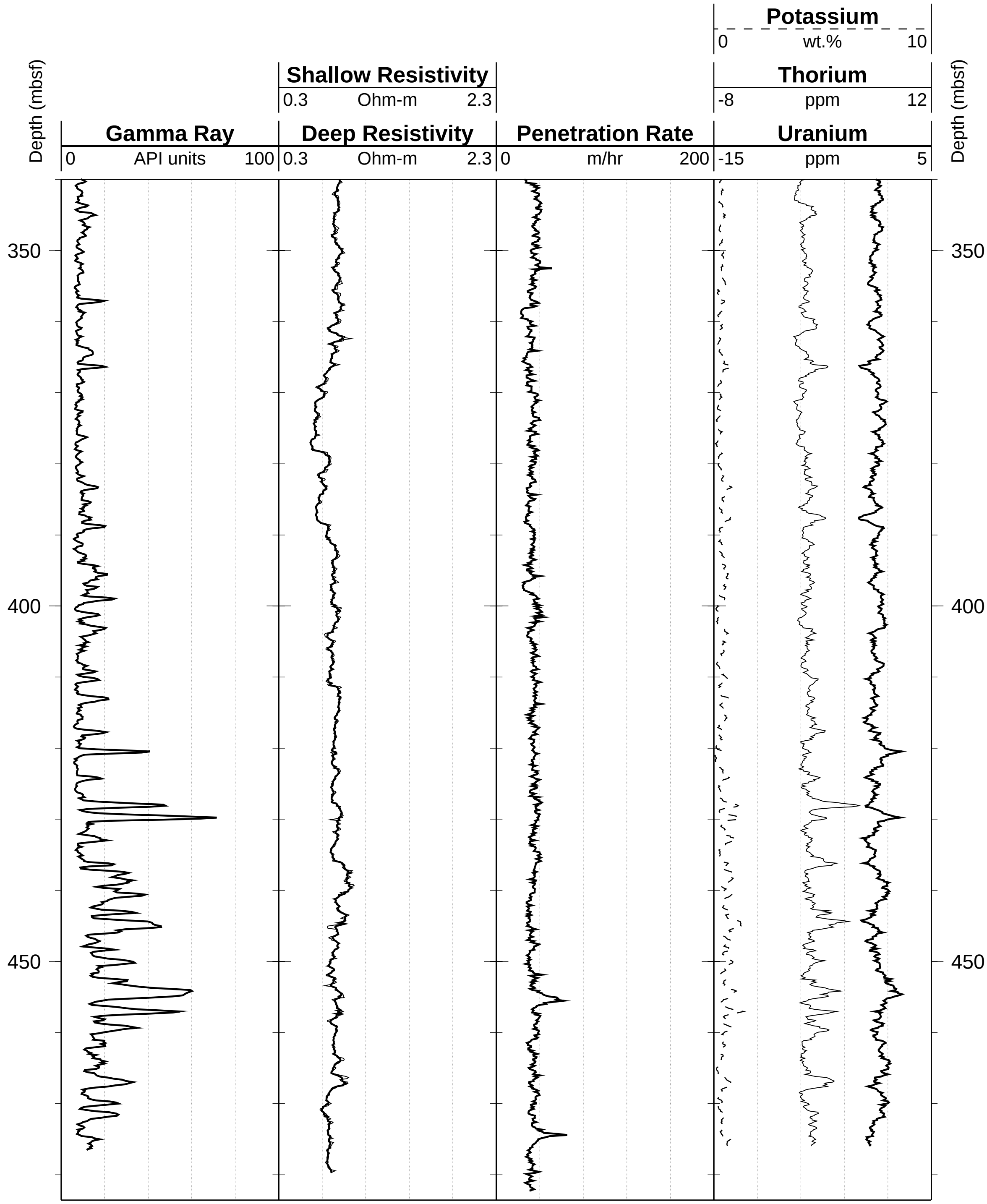
Hole 1043B: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data



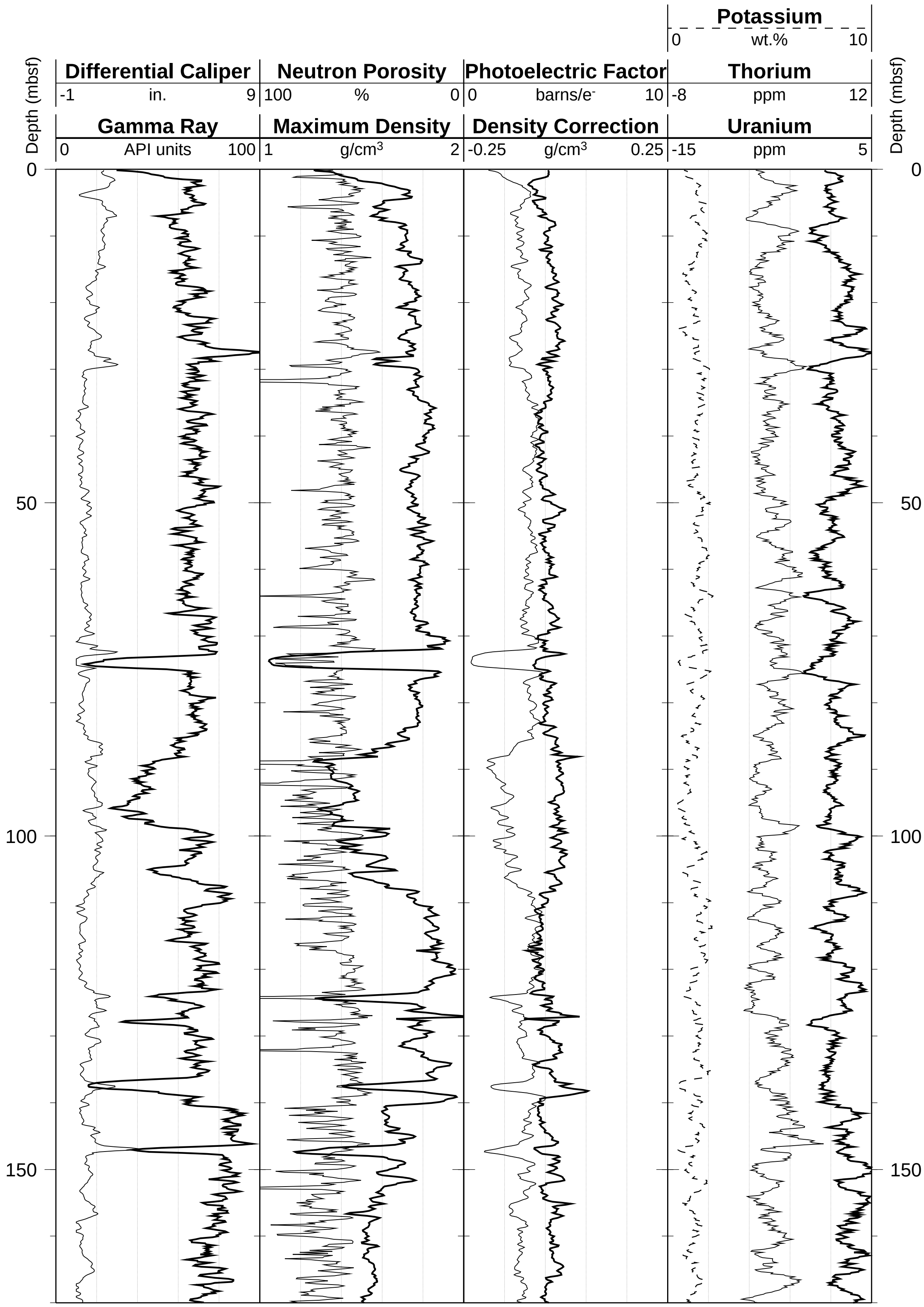
Hole 1043B: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data (cont.)



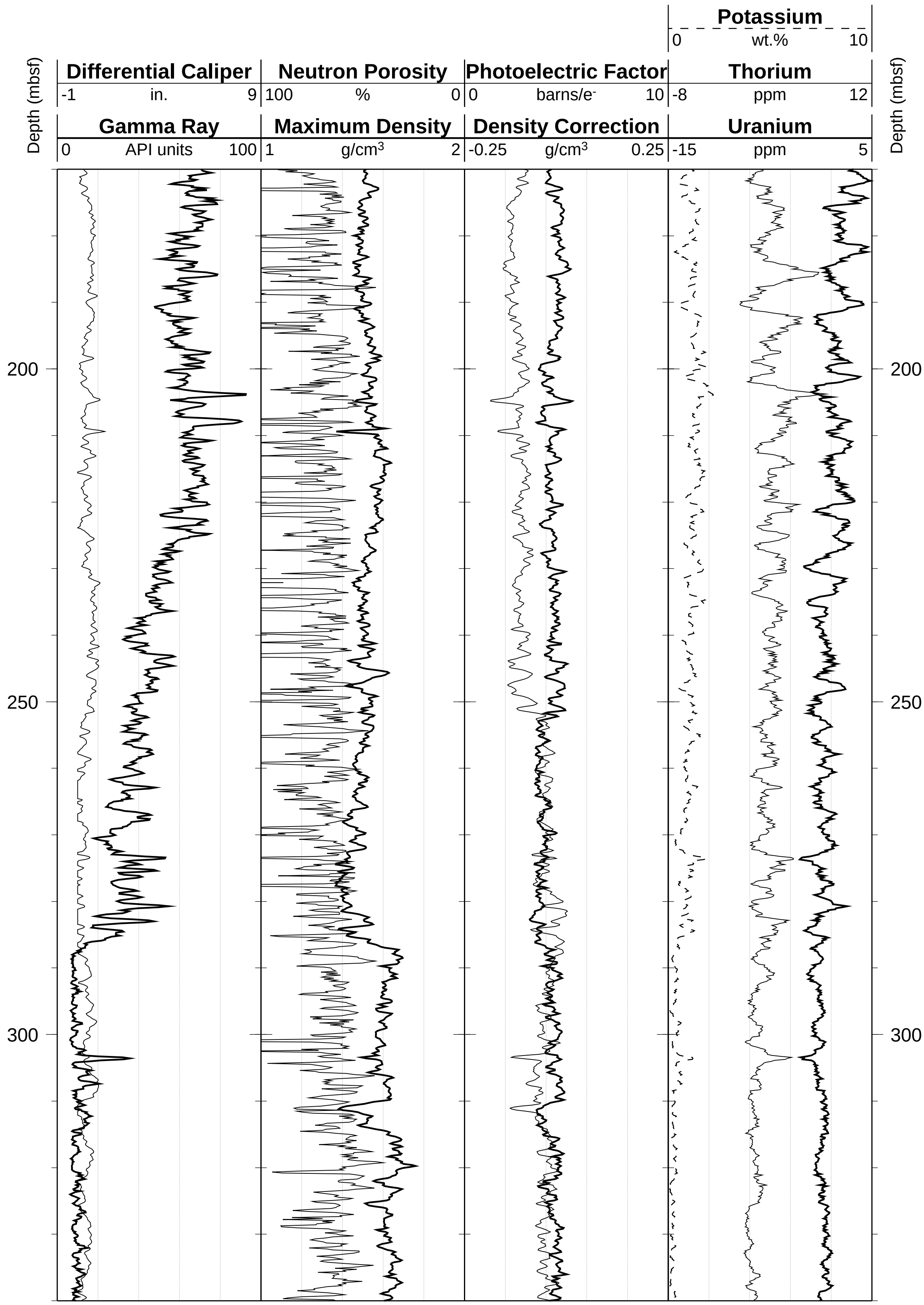
Hole 1043B: LWD Natural Gamma Ray-Resistivity-Penetration Logging Data (cont.)



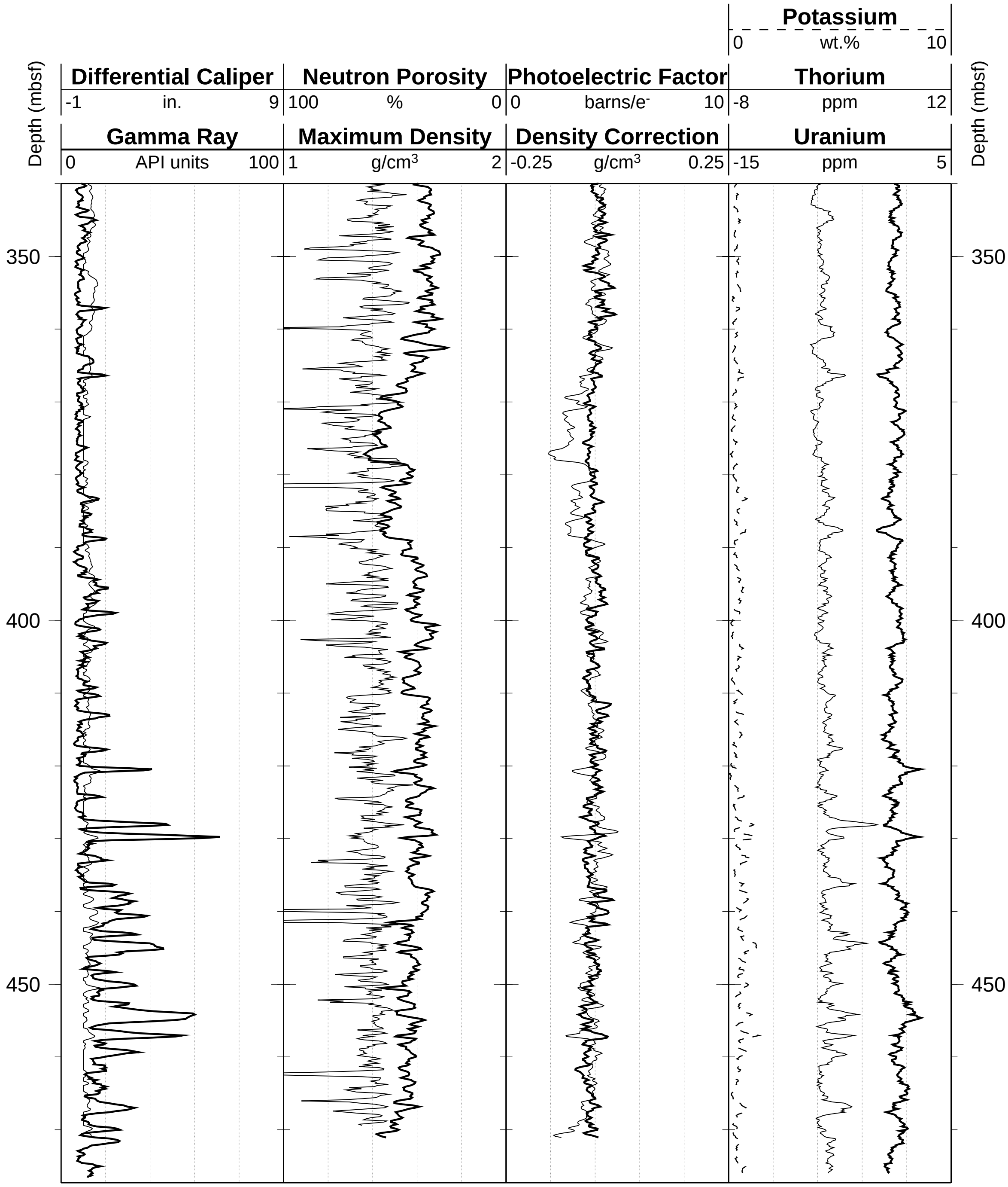
Hole 1043B: LWD Natural Gamma Ray-Density-Porosity Logging Data



Hole 1043B: LWD Natural Gamma Ray-Density-Porosity Logging Data (cont.)



Hole 1043B: LWD Natural Gamma Ray-Density-Porosity Logging Data (cont.)



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