Public document

Geological study of the GPK4 HFR borehole and correlation with the GPK3 borehole (Soultz-sous-Forêts, France)

Final Report

BRGM/RP-53697-FR
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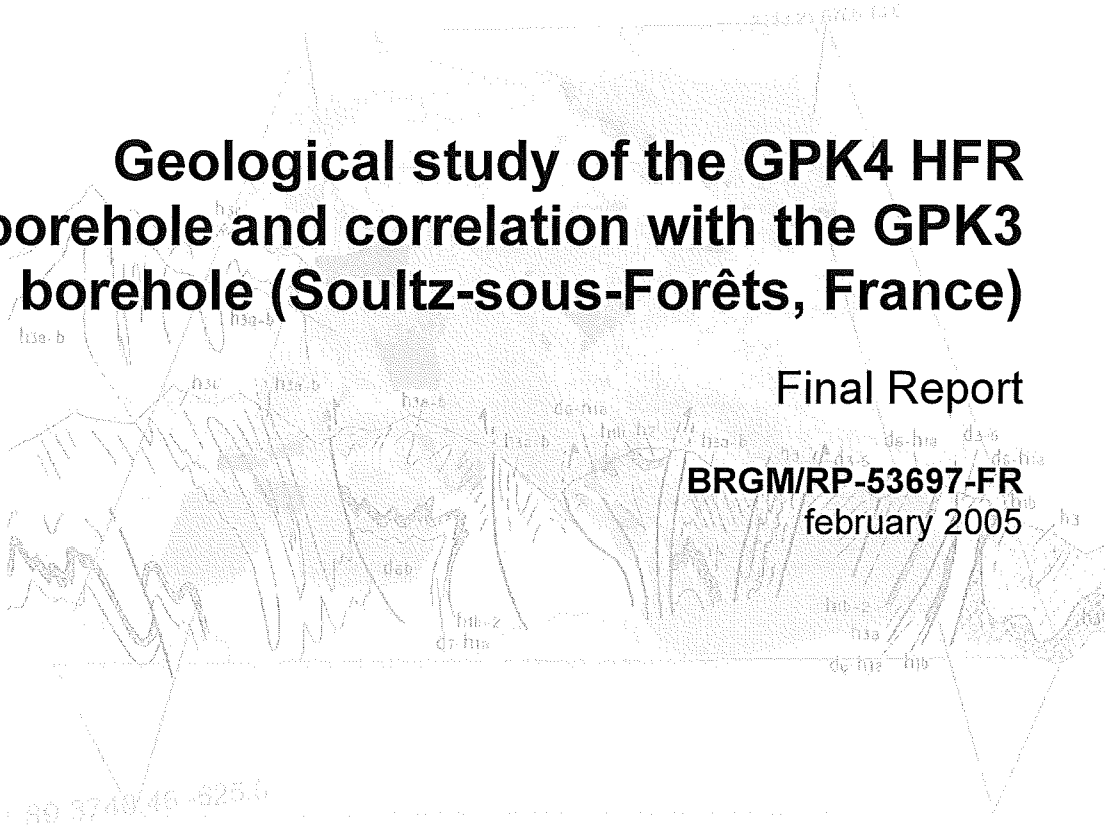

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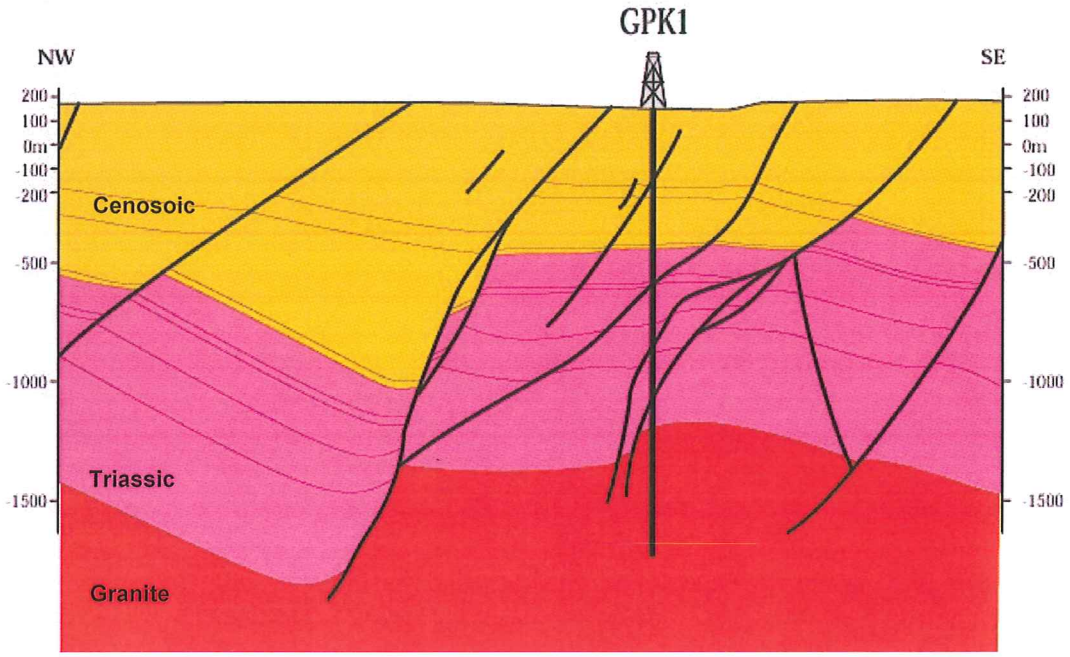

Figure 2 - Geological cross-section through the GPK1 well.

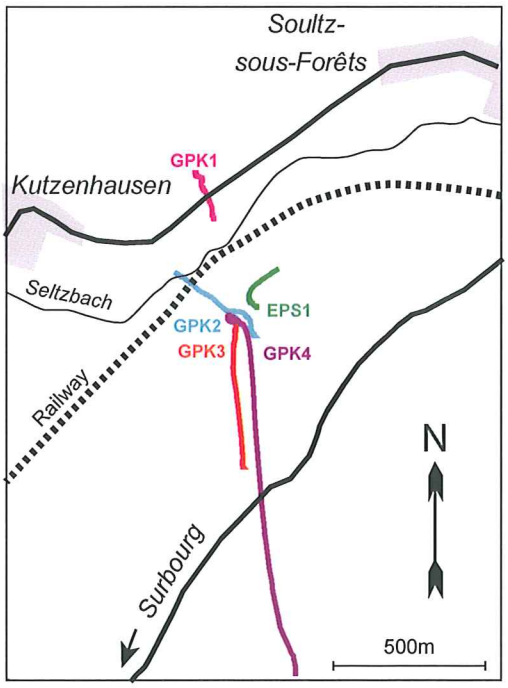

Figure 3 - Location of the Soultz boreholes and their trajectories.

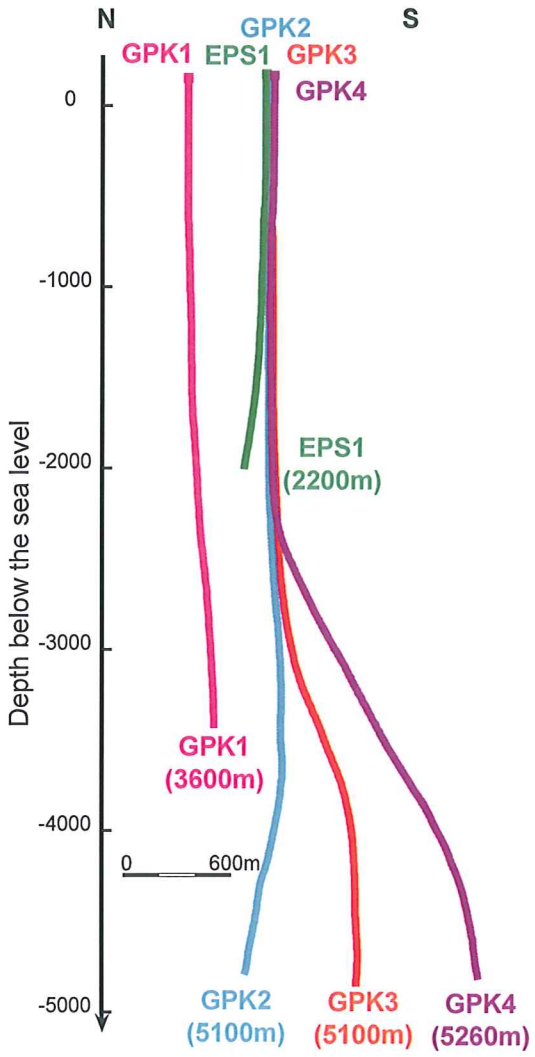

Figure 4 - N-S cross section of the Soultz well field.

The vertical depth are expressed below the sea level.

The well logging operations were conducted by Schlumberger at different times (27/10/03, 15/02/04, 12/04/04) in the GPK4 well. Schlumberger logs are depth matched according to the 13"3/8 casing shoe at 1446m for the logging in the 12"1/4 section and the 9"5/8 casing shoe at 4767m for the 8"1/2 section. For the driller, the depths of casing shoes are 1446m and 4756m respectively. There is a -11m difference between the "driller" depth and the "logging" depth.

The aim of this report is to build the geological profile of the granitic section of the GPK4 well based on cutting examination, well logging data and Ultrasonic Borehole Image (UBI) logs. No geological profile was done in the sedimentary part of the GPK4 well (0 to 1418m).

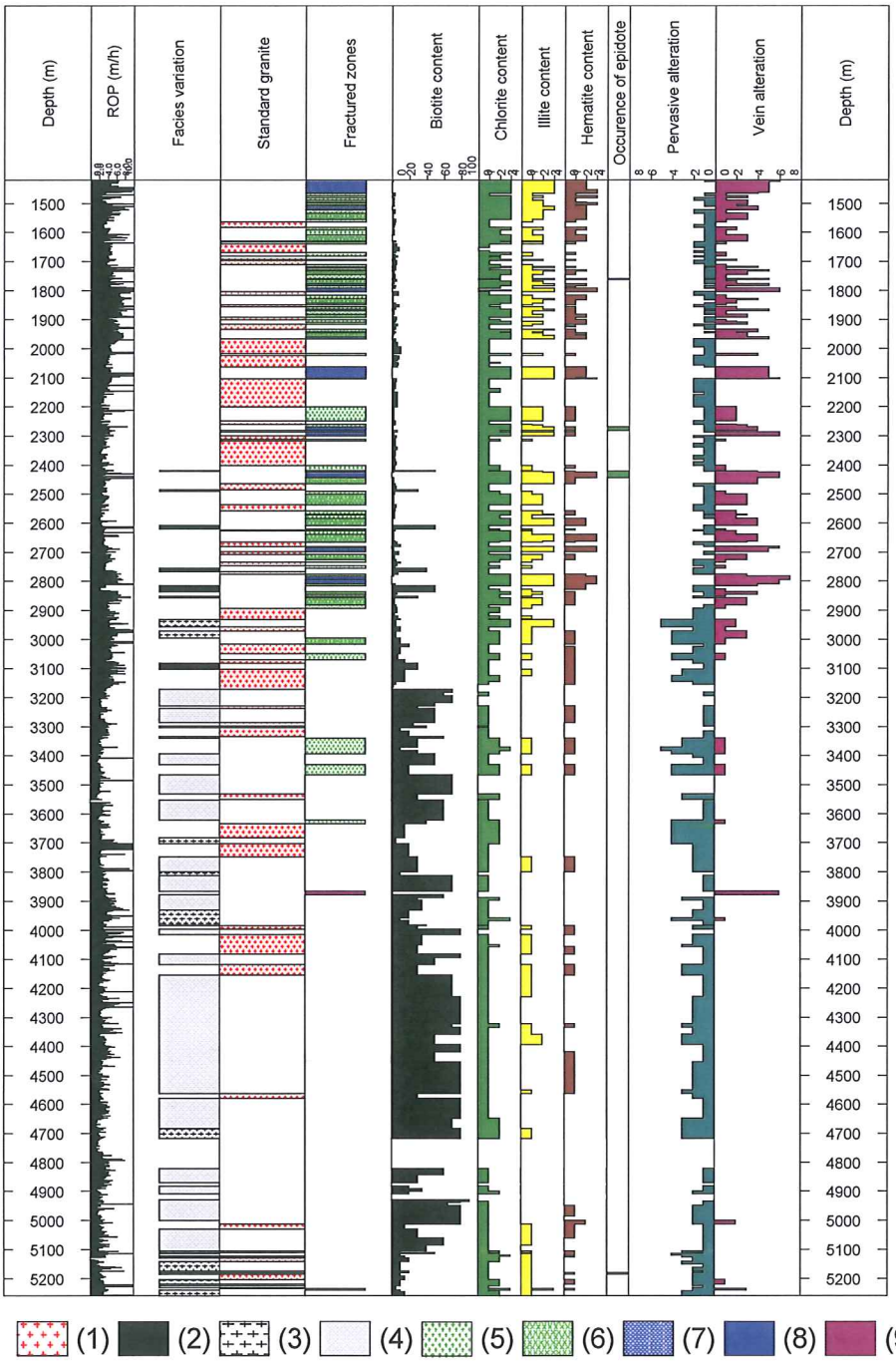

Figure 7 - Raw synthetic log of GPK4 between 1420-5260m based on cutting analysis.

ROP: rate of penetration. Legend of facies variation, standard granite and fractured zones: (1) Standard granite ; (2) Biotite rich granite ; (3) Two-mica granite ; (4) Granite artificially enriched in biotite due to drilling process ; (5) Low altered granite ; (6) Moderately altered granite ; (7) Highly altered granite ; (8) Extremely altered granite ; (9) Quartz vein. Bioitite, chlorite, illite and hematite content: see explanation in the text.

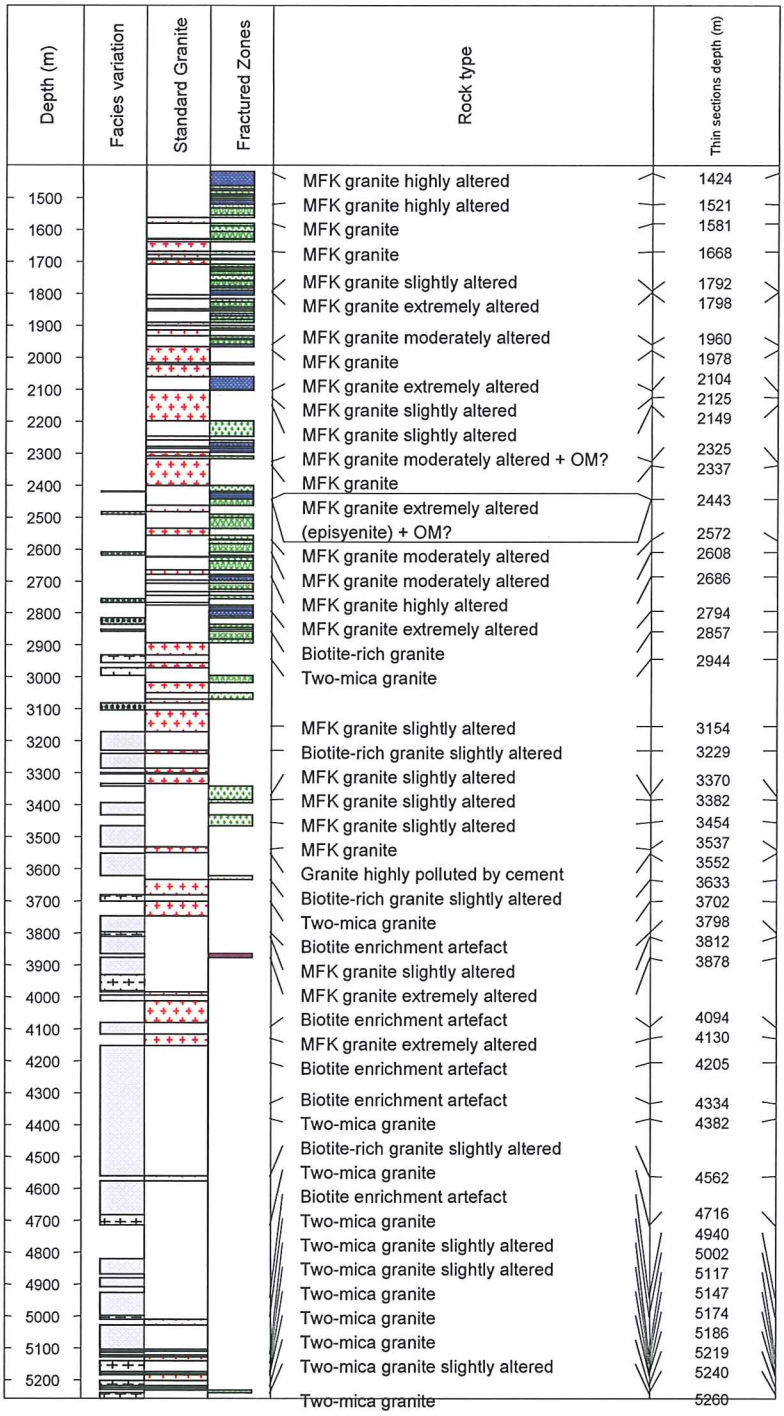

Figure 8 - Results of microscopic observations of cutting thin sections in GPK4 versus the raw petrographical log. (Legend of petrographical patterns: cf. Figure 7).

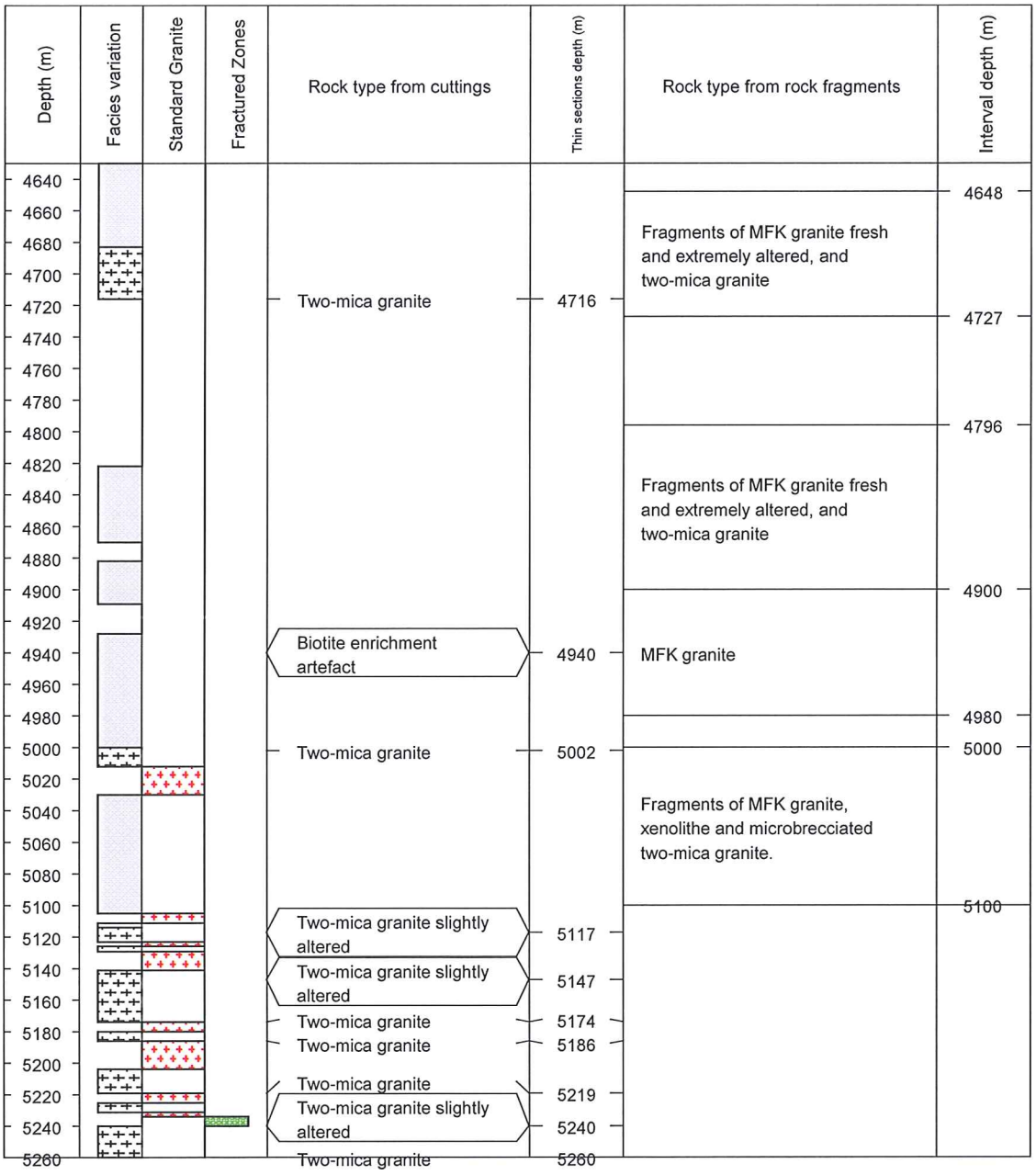

Figure 9 - Results of microscopic observations of cuttings and rock fragments in the open hole section of GPK4 versus the raw petrographical log.
(Legend of petrographical patterns: cf. Figure 7).

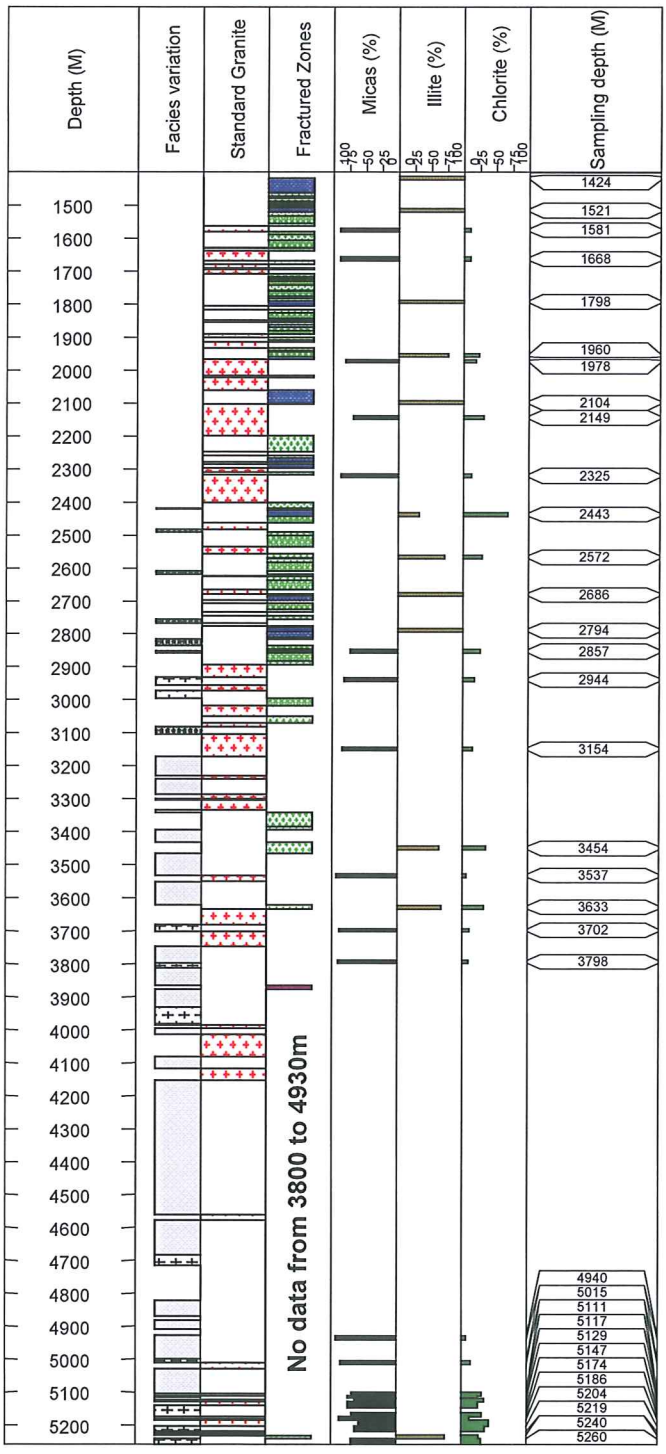

Figure 13 - Distribution of clay minerals based on X-ray diffraction analysis on selected samples in the GPK4 well. The mineral percentages (micas, illite, chlorite) are based on the whole mineral sum. (Legend of petrographical patterns: cf. Figure 7).

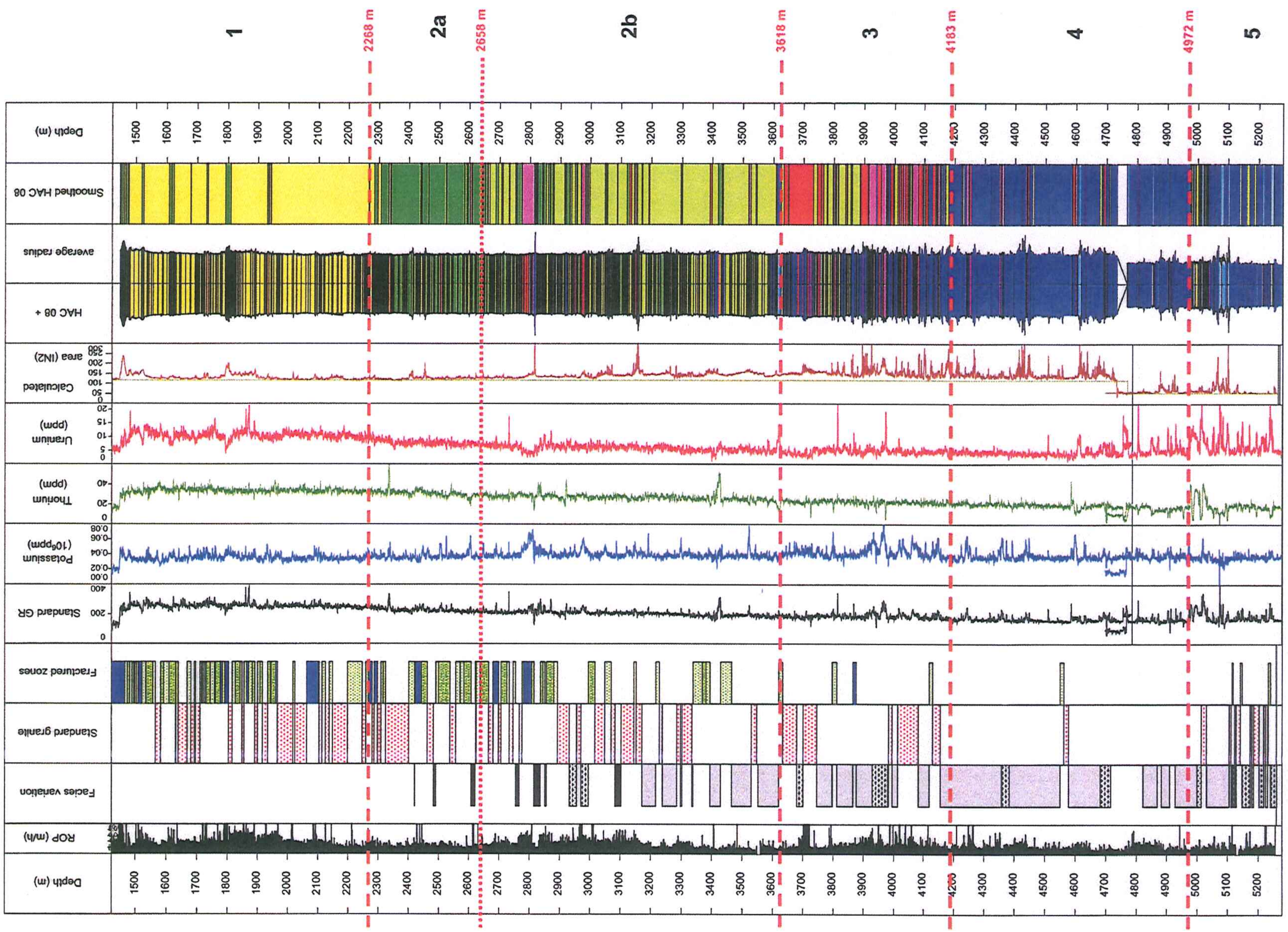

Figure 19 - Composite geological profile of GPK4 well based on cutting analysis, geophysical logs and HAC analysis. The colour legend of the initial HAC and smoothed HAC classes are described in tables 2 and 3 respectively. The red lines indicate the limits of sections 1 to 5 explicated in the text.