

# Kontinentales Tiefbohrprogramm der Bundesrepublik Deutschland Goelectrical Measurements at the KTB Location

## GEOELECTRICAL MEASUREMENTS AT THE KTB LOCATION

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From March to June 1987 an intensive study of selfpotential, VLFR and DC-resistivity were performed on a 1 km<sup>2</sup> area around the pre- and maindrilling site. The measurements were made by the University of Frankfurt and by the Free University of Berlin. The aim was to secure geoelectrical data in that area as long as it was accessible before the installation of the drilling equipment. At present the processing of the large amount of data concentrated on its presentation.

The selfpotential measurements at about 1100 points revealed a large scale anomaly of values down to -500 mV (see Fig.1). The peaks of the anomaly are located around places of graphitic material at the earth's surface.

VLFR measurements at about 800 points display the apparent resistivity  $\rho^*$  of the upper 20-50 m. The most important result is a clear division of the drilling location into two areas, one in the west and southwest with low resistivities around 10  $\Omega\text{m}$ , the other further east with high resistivities up to 3000  $\Omega\text{m}$ . Fig.2 presents a perspective view of isolines of the apparent resistivity.

Several pole-dipole profilings across the area in different directions with electrode separations up to 300 m confirmed the lateral resistivity variations obtained by VLFR. The result of one pole-dipole profile is presented in Fig.2 in the usual pseudo-section manner in the vertical direction.

At 14 sites Schlumberger sounding curves were measured. These measurements have been extended - with regard to the strong lateral resistivity variation - by measuring the complete tensor. The processing of the tensorial resistivity is still a topic of research and therefore still in progress.

In order to demonstrate the effect of strong lateral resistivity variation the sounding at the presite was performed according to the Hummel configuration ("Half-Schlumberger"). The measured curves are presented in Fig.3: Curve A represents the apparent resistivity measured with one electrode moving towards point A, curve B with the other electrode moving towards B. The profile AB agrees with the cross-section of Fig.2. One may clearly see the strong effect of lateral resistivity variation by expanding electrode separation. A Schlumberger sounding at the same site yielded just the mean of both Hummel curves.

### Conclusion:

The geoelectrical measurements in the neighbourhood of both drilling sites revealed a large variation of the resistivity from the southwest towards the northeast. It seems that this may be explained by the existence of considerable amounts of graphite.

Fig.1  
Selfpotential

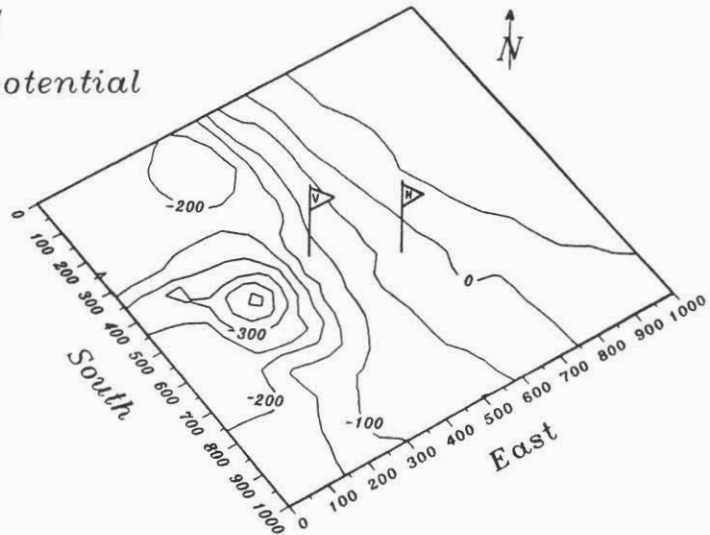


Fig.2  
Resistivity

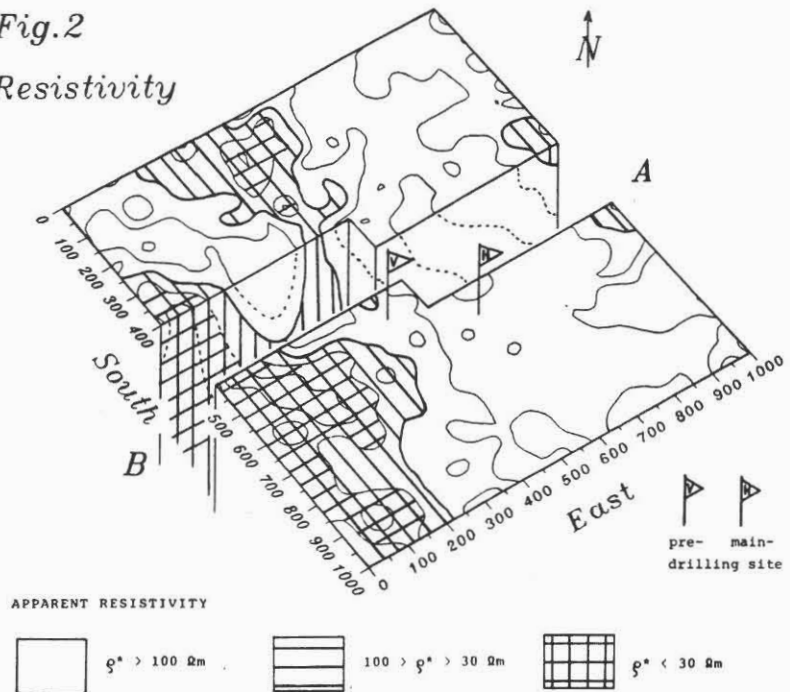


Fig.3  
Hummel-Sounding  
Predrilling Site

