

CONTRIBUTION THE GEOPHYSIC METHODS IN THE EXPLORATION THE MASSIVE SULPHIDE MINERALIZATION IN SHEH-POLIS AREA (ALBANIA)

D. GJOVREKU

Kolegji Kristal, Rr Komuna e Parisit, Tirana, Albania; kristal a sanx.net

Abstract: The volcanogenic massive sulphide(VMS) mineralization are located in the contact of basalts MORB-type and radiolarian cherts of the volcano-sedimentary formation. Anomaly, which are interpreted in relation with the VMS mineralization and possibilities of further exploration to materialize targets with rich-copper are assessed as likely to happen, have been noticed by use of electromagnetic methods of low frequency.

Keywords: Volcano-sedimentary formation, VMS mineralization, electromagnetic method TURAM.

By the end of 90's there has been a notable development regarding the Copper industry, where the main position in exploration was occupied by low copper content deposits (0,5-1% of Cu).

Presently the copper industry in Albania has failed and only the exploration and discovery of sulfide massive reserves of a high content of Copper can help recovering this industry. In frame of this initiative, assisting the other essential geophysics methods where the main position is occupied by provoked polarization, we have re-analyzed many already accomplished geophysics researches performed by electromagnetic methods of low frequencies that help in the exploration of the volcanogenic massive sulphide(VMS) mineralization(Alikaj, Delaj 1994, Delaj 1985, Gjovreku 1986, Boschart 1983, Coggon 1971, Hoxha 1995.)

Usage of electromagnetic methods of low unit frequency in Albania has been used successfully in the research of parts containing VMS mineralization by dividing them from sulphide disseminated mineralization(Gjovreku 1987).

In Sheh-Polis region, as well as in other regions, we have chosen the preservation method of phase differences (PD) and amplitude relation (filed strength ratio FSR) which are called TURAM.

1. Geological setting

The Sheh-Polis region is composed of ophiolitic, sedimentary and metamorphic formations of Mirdita zone, overthrust over the Maastrichtian- Eocen flysch of the Krasta subzone (Puloj et al.1984,Kodra et al. 1993)

The ophiolite formations of Sheh-Polis area are represented by:

- The MOR-type ophiolites. The mantle sequence represented mainly by harzburgite (σJ_2).
- The volcano-sedimentary formation represented by MORB-type basaltic pillow lavas interbedded with radiolarian cherts and shales. (βT_{2-3}).
- Basaltic formation (βJ_2).

In the border of the ultramaphik formation with the volcano-sedimentary formation is met amphibolite etc of the metamorphic sole (μl_2).

In the Sheh-Polis region the melange “block in matrix” type is also spread. (J_3) Its position is generally tectonic and may be interpreted as a prism accretion formation forming in the oceanic bassin.

2.VMS mineralization of the Sheh-Polis area

In the Sheh-Polis area the Volcano-sedimentary formation (βT_{2-3}) presents interest for the exploration the target of VMS mineralization. As well as in other regions where this formation is spread as in Gjegjan, Palaj-Karma, Rubik, Parava, etc basalt-chert intercalation contain lenticular, pensill-like pseudo stratiform VMS mineralization . Especially essential is the resource of Gjegjan deposit where 6 million tons of 3, 51% Cu, 42%S, 0,9%Zu, and 0,07% Co have been exploited.

In the Sheh-Polis two occurences of VMS mineraization appear. They are localized in the upper part of the volcano-sedimentary formation, near the passage of this last one, in the metamorphic sole.

The northern occurrence has an extension in the surface of 15-20m, thickness of 2-5m. The copper content fluctuates through these limits 2-6%, while sulfur of 38-43%. These enlarge from northeast to southwest.

The south occurrence is localized among the basaltic breccias. This is met in an extension of 60-80m of a thickness up to 7m. The enlargement is approximately northern-south. The geological data suggest a curved connection through the two occurrences, which are reflected in the basaltic pillow-lava structures and siliceous and argillaceous schists among which the two occurrences are localized.

3.The geophysics results

The electromagnetic works of the land in the Sheh-Polis area have been performed accompanied by the geological mapping in scale 1:5000.

The parametric gauging performed in the mineralized zones with sulphide disseminated which accompany the VMS mineralization show that in both of these occurrences electric conductivity fluctuates in these limits : $\sigma=1,3-2,7$ mhos/m.

The samples of basalts which construct volcano-sedimentary section cutting by the VMS orebody have a specific electric conductivity of wide limits

$\sigma=0,0002-0,001$ mhos/m while the argillaceous schists $\sigma=0,002-0,006$ mhos/m.

The graphic of the field strength ratio (FSR) as well as of the phase differences (PD) show interesting data. Occurrence the mineralized zone with sulphide disseminated causes asymmetric anomaly with an intensity up to 1,6 (FSR) and $+5^\circ$ (PD). Another anomaly appears at the focal point of this anomaly, which is very regular with geometric distinguished feature, where the PD reaches -15° in the background of a asymmetric FSR, which reaches up to 1,3.

Calculations that we have already done for this anomaly based on accomplished formats allow us to suppose a mass of ore of VMS : $\sigma 1,2$ mhos.

By analogy with the region Sheh-Polis with the region of Palaj-Karma deposit with a pencil-like morphology and followed in an extension for 2300m. may be supposed in a exploration possibility peer target.

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