INTISARI

PEMETAAN SUNGAI BAWAH TANAH MENGGUNAKAN METODE VLF-EM DENGAN KOREKSI TOPOGRAFI DI SEKITAR GUA RATNO-SIS DI DESA GIRITIRTO, KECAMATAN PANGGANG, KABUPATEN GUNUNGKIDUL, YOGYAKARTA

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Penelitian ini dilakukan di sekitar Gua Ratno-Sis yang merupakan daerah karst dan mempunyai sungai bawah tanah di dalamnya. Metode yang digunakan adalah *Very Low Fruquency Electromagnetik* (VLF-EM). Akuisisi data dari VLF-EM menghasilkan data tilt, elips, medan magnet horizontal dan medan magnet vertikal. Data tersebut dilakukan *filter* koreksi topografi, *filter moving average*, *filter Fraser*, dan *filter Karous-Hjelt*. Hasil dari *filter Fraser* berupa puncakan dan *filter Karous-Hjelt* berupa peta Rapat Arus Ekuivalen yang tinggi mengindikasikan letak anomali konduktif di lintasan penelitian.

Berdasarkan hasil penelitian, koreksi topografi bermanfaat untuk menghasilkan data tilt yang sesuai dengan kontur lintasan penelitian. Zona konduktif di lintasan A yang berada di jarak 170 m dengan kedalaman 30 m diduga menerus ke lokasi sungai bawah tanah Gua Ratno-Sis, dengan pola aliran air dari utara ke selatan. Pada lintasan B ditemukan kekar yang diduga memiliki hubungan dengan sungai bawah tanah Gua Ratno-Sis dan zona konduktif di lintasan B di jarak 285 m dengan kedalaman 50 m. Lalu di jarak 250 m lintasan C diduga terdapat zona yang sangat konduktif yaitu lapisan batulempung. Dari hasil penelitian tersebut, dapat disimpulkan bahwa metode VLF-EM dapat digunakan untuk memetakan zona konduktif di sekitar daerah karst.

Kata Kunci: VLF-EM, konduktivitas, sungai bawah tanah

ABSTRACT

UNDERGROUND RIVER MAPPING USING VLF-EM METHOD WITH TOPOGRAPHIC CORRECTION AROUND RATNO-SIS CAVE IN GIRITIRTO VILLAGE, PANGGANG DISTRICT, GUNUNGKIDUL REGENCY, YOGYAKARTA

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This research was conducted around Ratno-Sis Cave which is a karst area and has an underground river in it. The method used is Very Low Fruquency Electromagnetic (VLF-EM). Data acquisition from VLF-EM produces tilt data, ellipses, horizontal magnetic fields and vertical magnetic fields. The data is carried out by topographic correction *filter*s, moving average *filter*s, Fraser *filter*s, and *Karous-Hjelt filter*s. The results of the Fraser *filter* are in the form of a spike and a *Karous-Hjelt filter* in the form of a high equivalent current density map indicating the location of the conductive anomaly on the research path.

Based on the results of the study, topographic correction is useful to produce tilt data that matches the contours of the research path. The conductive zone on line A, at a distance of 170 m with a depth of 30 meters, is suspected to have continued to the location of the underground river of Ratno-Sis Cave, with the water flowing from north to south. On line B, two joints are found and expected that they associated with the underground river of Ratno-Sis Cave and conductive zone of line B at a distance of 285 m with a depth of 50 m. Then, at a distance of 250 m on line C, there was a very conductive zone which is thought to be a claystone layer. From the results of these studies, it can be concluded that the VLF-EM method can be used to map conductive zones around the karst area.

Keywords: VLF-EM, conductivity, underground river