

## ABSTRAK

# IDENTIFIKASI ZONA MINERALISASI DENGAN METODE GEOLISTRIK RESISTIVITAS DAN TIME DOMAIN INDUCE POLARIZATION (TDIP) KONFIGURASI *GRADIENT* PADA AREA “X”, JAWA TIMUR

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Emas merupakan logam mulia yang menjadi acuan ekonomi dunia, karena itu emas banyak dicari. Indonesia, memiliki potensi emas besar khususnya di area Jawa Timur, perlu dilakukan suatu eksploitasi untuk menambang sumberdaya yang bernilai ekonomis, karena keterbatasan informasi bawah permukaan, diperlukannya eksplorasi salah satunya dengan metode geolistrik untuk menganalisis anomali geofisika (resistivitas dan chargeabilitas), dalam memetakan distribusi mineralisasi emas di daerah “X”, PT Bumisuksesindo.

Penelitian ini dilakukan di daerah “X”, Banyuwangi, Jawa Timur. Eksplorasi ini menggunakan metode TDIP konfigurasi *gradient* dengan luas 2,5 km × 0,6 km, panjang lintasan 1.225 m berorientasi barat–timur, dengan enam lintasan, spasi elektroda 25 m, dan  $n=1-4$ . Analisis dilakukan terhadap anomali chargeabilitas dan resistivitas hasil survei TDIP yang dikorelasikan dengan data bor serta pemetaan geologi untuk mengetahui hubungan dengan mineralisasi emas sebagai dasar eksplorasi lanjutan. Pengolahan data dengan *Res2Dinv* untuk inversi dan pemodelan 2D, serta *Leapfrog* untuk korelasi penampang dan peta *slicing* kedalaman.

Hasil menunjukkan rentang resistivitas (3,2–2905,4) Ohm-m dan chargeability (0,91–65,14) msec. Zona alterasi argilik (tuff, batupasir) memiliki resistivitas <150 Ohm-m, zona *advance argilik* (breksi hidrotermal) (150–500) Ohm-m, dan zona silisikasi (batuan terobosan) >500 Ohm-m. Distribusi lateral nilai chargeability menunjukkan zona prospek dengan nilai >30 msec yang dominan di area tengah dan sebagian di area barat. Zona ini secara litologi tersusun oleh tonalit sebagai batuan induk pembawa sulfida yang diapit oleh breksi hidrotermal dan batupasir dengan resistivitas (20–500) Ohm-m. Berdasarkan peta *slicing* kedalaman, target prospektif utama berada di area tengah dan barat yang memperlihatkan kemenerusan anomali chargeability tinggi >30 msec dan resistivitas sedang (150–500) Ohm-m pada litologi breksi hidrotermal.

Kata kunci : chargeabilitas, *gradient array*, mineralisasi, resistivitas, TDIP.

## **ABSTRACT**

# **IDENTIFICATION OF MINERALIZATION ZONES USING THE RESISTIVITY GEOELECTRICAL METHOD AND TIME DOMAIN INDUCE POLARIZATION (TDIP) GRADIENT CONFIGURATION IN AREA “X”, EAST JAVA**

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*Gold is a precious metal that serves as a global economic benchmark; therefore, it is highly sought after. Indonesia has significant gold potential, particularly in East Java, and exploration is required to exploit economically valuable resources. Due to limited subsurface information, geophysical exploration is necessary, one of which is the geoelectrical method used to analyze resistivity and chargeability anomalies for mapping the distribution of gold mineralization in area “X”, PT Bumisuksesindo.*

*This research is conducted in area “X”, Banyuwangi, East Java, using the Time Domain Induced Polarization (TDIP) method with a gradient configuration. The survey covers an area of 2.5 km × 0.6 km, with a total profile length of 1,225 m oriented west–east, consisting of six survey lines, an electrode spacing of 25 m, and  $n = 1-4$ . The analysis focuses on resistivity and chargeability anomalies derived from TDIP data, which are correlated with drilling data and geological mapping to evaluate their relationship with gold mineralization as a basis for further exploration. Data processing employs Res2Dinv for 2D inversion and modeling and Leapfrog for cross-section correlation and depth slicing analysis.*

*The results show resistivity values ranging from (3,2–2905,4) Ohm-m and chargeability values ranging from (0,91–65,14) msec. Argillic alteration zones (tuff and sandstone) exhibit resistivity values <150 Ohm-m, advanced argillic alteration zones (hydrothermal breccia) show resistivity values of (150–500) Ohm-m, and silicification zones (intrusive rocks) display resistivity values >500 Ohm-m. The lateral distribution of chargeability identifies prospective zones with values >30 msec, which dominate the central area and partially extend into the western area. These zones are lithologically composed of tonalite as the sulfide-bearing host rock, flanked by hydrothermal breccia and sandstone with resistivity values ranging from (20–500) Ohm-m. Based on the depth slicing map, the main prospective targets are located in the central and western areas, showing continuity of high chargeability anomalies >30 msec and moderate resistivity (150-500) Ohm-m within hydrothermal breccia lithology.*

*Keywords: chargeability, gradient array, mineralization, resistivity, TDIP*