

INTISARI

IDENTIFIKASI MODEL GEOLOGI SEBAGAI PARAMETER PEMILIHAN AREA PEMBUANGAN LIMBAH LAPANGAN MINYAK DAN GAS BUMI AMALGAM BERDASARKAN DATA GEOLISTRIK *SOUNDING (VES)* DAN *MAPPING* (*RESISTIVITY*)

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Identifikasi Model Geologi Lapangan Minyak dan Gas Bumi Amalgam dilakukan karena PT Energi Mega Persada Tbk (EMP) memerlukan tempat pembuangan limbah air terproduksi, namun tidak mungkin untuk dibuang pada lapisan tanah dan lingkungan terbuka, pemukiman dan perkebunan sawit milik masyarakat yang berpotensi mencemari lingkungan sehingga penelitian ini difungsikan untuk mengetahui bagaimana sebaran litologi dan zona akuifer air tanah agar pembuangan limbah *contaminant* minyak dan gas bumi yang diambil oleh EMP tidak mencemari air tanah Lapangan Amalgam.

Penelitian ini dilakukan dengan pengumpulan data lapangan berupa data sekunder metode geolistrik *sounding vertical electrical sounding (VES)* konfigurasi Schlumberger dan geolistrik *mapping* konfigurasi *Wenner Alpha* untuk analisis kedalaman lapisan kedap dan akuifer air tanah. Data metode geolistrik konfigurasi *Schlumberger* berupa nilai $\frac{AB}{2}$, $\frac{MN}{2}$, beda potensial (V), kuat arus (I), sedangkan data metode geolistrik konfigurasi *Wenner Alpha*, yaitu jarak elektroda arus (C_1 & C_2), jarak elektroda potensial (P_1 & P_2), beda potensial (V), dan kuat arus (I), serta koordinat pada setiap titik pengukuran.

Hasil penelitian yang diperoleh pada daerah penelitian Lapangan Amalgam berupa lapisan litologi berupa lapisan top soil, batupasir, batupasir akuifer, batupasir kerikil, batulempung, pasir lempungan, dan lempung pasir. Berdasarkan interpretasi profil litologi 1D, korelasi litologi, penampang 2D, peta *slicing*, dan pemodelan 3D, zona yang diinterpretasikan dapat dijadikan sebagai zona pembuangan limbah *produced water* terletak di bagian barat laut Lapangan Amalgam. Zona bagian barat laut yang diinterpretasikan sebagai zona pembuangan limbah *produced water* mencakup wilayah seluas 80.000 m² dari x = 802800, y = 26000 hingga x = 802200, y = 25800. Dengan penetrasi kedalaman yang diperoleh pada titik VES 04 sedalam 53,6 m, volume maksimal yang dapat ditampung pada zona sebesar 4.288.000 m³.

Kata kunci: limbah, geolistrik, *VES*, konfigurasi Schlumberger, litologi.

ABSTRACT

GEOLOGICAL MODEL IDENTIFICATION AS A PARAMETER FOR WASTE DISPOSAL AREA SELECTION OF AMALGAM OIL AND GAS FIELD WASTE BASED ON GEOELECTRIC SOUNDING (VES) AND MAPPING (RESISTIVITY) DATA

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Geological model identification as a parameter for waste disposal area selection of amalgam oil and gas field waste based on geoelectric sounding (ves) and mapping (resistivity) data was carried out because PT Energi Mega Persada Tbk (EMP) requires a place to dispose of produced water waste, but it is not possible to dispose of it in the soil layer and open environment considering that there is residential areas and community-owned oil palm plantations. Disposal of produced water waste has the potential to pollute the environment, this research is used to determine the distribution of lithology (especially impermeable layers) and groundwater aquifer zones so that the disposal of oil and natural gas contaminant waste taken by EMP does not pollute the groundwater of the Amalgam Field.

The systematics of this research was carried out by collecting field data in the form of secondary data using the Schlumberger configuration geoelectric sounding vertical electrical sounding (VES) method and the Wenner Alpha configuration geoelectric mapping for analysis of the depth of the impermeable layer and groundwater aquifer. Schlumberger configuration geoelectric method data in the form of $\frac{AB}{2}$, $\frac{MN}{2}$, potential difference (V), current strength (I), while Wenner Alpha configuration geoelectric method data, namely current electrode distance (C_1 & C_2), potential electrode distance (P_1 & P_2), potential difference (V), and current strength (I), as well as the coordinates at each measurement point.

The results in the Amalgam Field research area were in the form of lithological layers in the form of top soil layer, sandstone, aquifer sandstone, gravel sandstone, mudstone, clay sand, and sandy clay. Based on the interpretation of 1D lithological profiles, lithological correlation, 2D cross sections, slicing maps, and 3D modeling, the interpreted zone can be used as a produced water waste disposal zone located in the northwestern part of the Amalgam Field. The northwestern zone which is interpreted as a produced water waste disposal zone covers an area of 80,000 m² from x = 802800, y = 26000 to x = 802200, y = 25800. With the penetration depth obtained at the VES 04 point as deep as 53.6 m, the volume The maximum that can be accommodated in the zone is 4,288,000 m³.

Keyword: waste, geoelectric, VES, Schlumberger array, lithology.