

ABSTRAK

KARAKTERISTIK HIDROGEOKIMIA DAN EVALUASI KUALITAS AIRTANAH SEBAGAI INDIKATOR KELAYAKAN KONSUMSI DI KECAMATAN KEJOBONG DAN SEKITARNYA, KABUPATEN PURBALINGGA, PROVINSI JAWA TENGAH

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Daerah penelitian berada di Kecamatan Kejobong, Kabupaten Purbalingga, Provinsi Jawa Tengah, yang tersusun oleh produk batuan vulkanik berupa lava andesit dan breksi vulkanik. Kondisi geologi tersebut berperan terhadap keberadaan dan karakteristik airtanah karena air yang meresap akan berinteraksi dengan batuan penyusun akuifer. Airtanah di daerah penelitian dimanfaatkan masyarakat untuk kebutuhan domestik, sehingga kondisi hidrogeologi, karakteristik hidrogeokimia, dan kualitas airtanah perlu diketahui untuk menilai kelayakannya sebagai sumber air minum. Penelitian ini bertujuan untuk mengetahui kondisi geologi dan hidrogeologi, mengidentifikasi karakteristik hidrogeokimia, serta mengevaluasi kualitas airtanah berdasarkan parameter fisika, kimia, dan biologi. Data yang digunakan meliputi data geologi permukaan, muka airtanah, geolistrik metode *Vertical Electrical Sounding*, ion mayor, dan kualitas airtanah. Metode penelitian meliputi pemetaan geologi dan hidrogeologi, pengukuran muka airtanah, interpretasi geolistrik, analisis ion mayor, interpretasi Diagram Stiff dan Diagram Trilinear Piper, serta evaluasi kualitas airtanah berdasarkan standar baku mutu yang berlaku. Hasil penelitian menunjukkan bahwa daerah penelitian tersusun atas Satuan Lava Andesit Ligung dan Satuan Breksi Vulkanik Ligung. Pola aliran airtanah bergerak dari utara–timur laut menuju selatan–barat daya mengikuti kondisi topografi. Hasil interpretasi VES menunjukkan bahwa lapisan pembawa airtanah berkembang pada batupasir tufan, sedangkan lapisan tuf dengan resistivitas lebih rendah diinterpretasikan sebagai lapisan kurang permeabel. Akuifer dangkal berada pada kedalaman 5,35–24,7 m, sedangkan akuifer utama berada pada kedalaman 47,1–87,3 m. Karakteristik hidrogeokimia airtanah didominasi oleh ion Ca^{2+} , Mg^{2+} , dan HCO_3^- dengan fasies utama Ca-Mg-HCO_3 . Berdasarkan evaluasi kualitas airtanah, seluruh sampel tidak layak dikonsumsi secara langsung karena mengandung *Escherichia coli* dan Total coliform. Oleh karena itu, diperlukan perbaikan konstruksi sumur, pengolahan air sebelum dikonsumsi, serta pemantauan kualitas airtanah secara berkala.

Kata kunci : Airtanah, Hidrogeokimia, Kualitas Airtanah, Vulkanik, VES

ABSTRACT

HYDROGEOCHEMICAL CHARACTERISTICS AND EVALUATION GROUNDWATER QUALITY AS AN INDICATOR OF CONSUMPTION FEASIBILITY IN KEJOBONG DISTRICT AND ITS SURROUNDINGS, PURBALINGGA REGENCY, CENTRAL JAVA PROVINCE

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*The research area is located in Kejobong District, Purbalingga Regency, Central Java Province, viiiactor composed of volcanic rock products consisting of andesite lava and volcanic breccia. These geological conditions play an important role in the occurrence and characteristics of groundwater because infiltrating water interacts with the rocks that compose the aquifer. Groundwater in the research area is used by the community for domestic purposes; therefore, hydrogeological conditions, hydrogeochemical characteristics, and groundwater quality need to be identified to assess its suitability as a source of drinking water. This study aims to determine the geological and hydrogeological conditions, identify the hydrogeochemical characteristics, and evaluate groundwater quality based on physical, chemical, and biological parameters. The data used include surface geological data, groundwater level data, geoelectrical data using the Vertical Electrical Sounding method, major ion data, and groundwater quality data. The research methods include geological and hydrogeological mapping, groundwater level measurement, geoelectrical interpretation, major ion analysis, interpretation of Stiff and Trilinear Piper Diagrams, and groundwater quality evaluation based on the applicable quality standards. The results show that the research area is composed of the Ligung Andesite Lava Unit and the Ligung Volcanic Breccia Unit. The groundwater flow pattern moves from the north–northeast toward the south–southwest, following the topographic conditions. The VES interpretation shows that the groundwater-bearing layer develops in tuffaceous sandstone, whereas the tuff layer with lower resistivity is interpreted as a less permeable layer. The shallow aquifer occurs at a depth of 5.35–24.7 m, while the main aquifer occurs at a depth of 47.1–87.3 m. The hydrogeochemical characteristics of groundwater are dominated by Ca^{2+} , Mg^{2+} , and HCO_3^- ions, with the main facies of Ca-Mg-HCO_3 . Based on groundwater quality evaluation, all samples are unsuitable for direct consumption because they contain *Escherichia coli* and Total coliform. Therefore, improvement of well construction, water treatment before consumption, and regular groundwater quality monitoring are required..*

Keywords : Groundwater, Groundwater Quality, Hydrogeochemistry, VES, Volcanic