

The Origin Groundwater of Rawadanau in Serang Banten, Indonesia

Priyo Hartanto¹, Rachmat Lubis¹, Boy Alam², and Hendarmawan Hendarmawan²

¹Indonesian Institute of Sciences

²Padjadjaran University

October 5, 2020

Abstract

Rawadanau, located in Serang, Banten, is the main water supply for the Cilegon industrial area, West Coast of Java, Indonesia, has geothermal potential. Understanding groundwater origin and quality is an essential factor in determining appropriate actions to save water supply sources. This paper aims to answer the groundwater origin that fills the Rawadanau, whose rocks are composed of volcanic products with evidence of the main elements of water chemistry and stable isotopes ($\delta^2\text{H}$ and $\delta^{18}\text{O}$). Analysis of pH, temperature, EC, HCO_3^- is carried out in the field, while other chemical elements and stable isotopes are analyzed in the laboratory. Groundwater found consists of hot springs, cold springs, dug wells, river water. Hierarchical analysis clusters based on water chemistry and stable isotopes can be grouped into two, cluster K (K1 and K2) and clusters L, respectively. Data of $\delta^2\text{H}$ and $\delta^{18}\text{O}$ of the spring waters in the Rawadanau indicate that they are of meteoric origin, and there has been evaporation from several springs. Water comes from meteoric water with stable isotopes content of $\delta^{18}\text{O}$ between -6.39 to -4.82 by two main mechanisms, namely rock dominance, and evaporation dominance. Aquifers are composed of product volcanic with the dominant composition rock of porphyritic andesite, basaltic andesite, and andesite. The multivariate statistical analysis results besides pH and SO_4 , all parameters (cation and anions) showed significant correlation. There are four groundwater facies, namely Ca-HCO_3 , Ca-Mg-HCO_3 , Mg-Ca-HCO_3 , and Na-Cl .

Hosted file

0880-Origin Groundwater of Rawadanau Serang-Banten-Indonesia_PriyoHartanto_et-al_HP.pdf available at <https://authorea.com/users/364078/articles/484990-the-origin-groundwater-of-rawadanau-in-serang-banten-indonesia>

Hosted file

Table 1.pdf available at <https://authorea.com/users/364078/articles/484990-the-origin-groundwater-of-rawadanau-in-serang-banten-indonesia>

Hosted file

Table 2.pdf available at <https://authorea.com/users/364078/articles/484990-the-origin-groundwater-of-rawadanau-in-serang-banten-indonesia>

Hosted file

Table 3.pdf available at <https://authorea.com/users/364078/articles/484990-the-origin-groundwater-of-rawadanau-in-serang-banten-indonesia>

Hosted file

Table 4.pdf available at <https://authorea.com/users/364078/articles/484990-the-origin-groundwater-of-rawadanau-in-serang-banten-indonesia>

Hosted file

Table 5.pdf available at <https://authorea.com/users/364078/articles/484990-the-origin-groundwater-of-rawadanau-in-serang-banten-indonesia>